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PROCEEDINGS

OF THE

Biological Society of Washington

VOLUME 32

1919

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For 1919

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T. S. Palmer, 1909, 1910
David White, 1911
E. W. Nelson, 1912, 1913
Paul Bartsch, 1914, 1915
W. P. Hay, 1916, 1917
J. N. Rose, 1918

*Deceased.

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The Committee on Publications declares that each paper of this volume was distributed on the date indicated on its initial page. The Index, title page, and minutes of meetings for 1919 (pp. i–xvi; 281–288) were issued on March 11, 1920.

Vol. 32, pp. ix-xvi

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

PROCEEDINGS.

The Society meets from October to May, on alternate Saturdays, at 8 P. M.

January 11, 1919—589th Meeting.[1]

Lecture Hall of the Carnegie Institution.

President Hugh M. Smith presided; 26 persons present.

New members elected, George Willett, Walter M. Giffard.

The deaths of Dr. Howard E. Ames and of Dr. W. F. Foster were announced.

President Smith announced the appointment to Standing Committees; on the Committee on Communications, A. S. Hitchcock, L. O. Howard, Alexander Wetmore, R. E. Coker and J. W. Gidley. On the Committee on Publications, C. W. Richmond, J. H. Riley, Ned Dearborn, W. L. McAtee.

Informal communications: A. S. Hitchcock, Note on the proposed list of generic names of plants, to be prepared by the Botanical Society of America; Hugh M. Smith, Note on the unusual blossoming of spring flowers; W. L. McAtee, Note on the early blossoming of spring flowers and the first blossoming of autumn flowers; L. O. Howard, Note on Prof. L. F. Ward's publication on blossoming out of season.

Formal communications: J. B. Norton, A new and easy way to recognize our local Asters; Lyman Carrier, Dr. John Mitchell as an early naturalist and historian; J. W. Gidley, The significance of the divergence of the first digit in the primitive mammalian foot; A. S. Hitchcock, A peculiar species of *Lasiacis*.

January 25, 1919—590th Meeting.[2]

Auditorium of the New National Museum.

President Hugh M. Smith presided; 29 persons present.

[1] Abstract in Journ. Washington Acad. Sci., vol. 9, pp. 175, 176, March 19, 1919.

[2] Abstract in Journ. Washington Acad. Sci., vol. 9, pp. 176, 177, March 19, 1919.

New members elected: Erich W. Schwartze, Myron H. Swenk, R. C. McGregor.

Informal communications: Hugh M. Smith, Note on the right whale, with exhibition of baleen, and note on the use of whale meat as human food; W. L. McAtee, Notes from a publication (1783–4) on cotton and peanut raising around Washington.

Formal communications: G. Dallas Hanna, Additions to the avifauna of the Pribilof Islands, including species new to North America; W. L. McAtee, An account of the poisonous sumachs, Rhus poisoning, and remedies therefor.

February 8, 1919—591st Meeting.[1]

Lecture Hall of the Cosmos Club.[2]

President Smith presided; 53 persons present.

New member elected: O. E. Jennings.

Amendment to By-Laws adopted: "The president shall not be eligible for immediate reelection" to follow at the end of the first paragraph of Article II.

Informal communications: R. W. Shufeldt, Notes on the presence of *Saracenia purpurea* near Glenburnie, Md., and experiments affecting its structure; W. P. Hay, Note on *S. purpurea* near the District of Columbia; I. N. Hoffman, Note on the nesting habits of Shufeldt's Junco.

Formal communications: E. W. Nelson, *Dallia pectoralis,* Alaska's most remarkable fish; Vernon Bailey, The western skunk cabbage in its prime; M. W. Lyon, Jr., Isohemoagglutinin groups of men.

February 22, 1919—592d Meeting.[3]

President Smith presided; 42 persons present.

New member elected: O. P. Hopkins.

Informal communications: A. S. Hitchcock and A. D. Hopkins commented upon Birds of Colombia, recently published by Frank M. Chapman.

Formal communication: Address by the retiring President, Dr. J. N. Rose, Botanical Explorations in Ecuador.

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[1]Abstract in Journ. Washington Acad. Sci., vol. 9, pp. 177, 178, March 19, 1919.

[2]All of the remaining meetings were held in the same place.

[3]Abstract in Journ. Washington Acad. Sci., vol. 9, pp. 205, 206, April 4, 1919.

March 8, 1919—593d Meeting.[1]

Vice-President Hollister presided; 60 persons present.

Informal communications: Paul Bartsch, Note upon annual visits of a purple finch; L. O. Howard, Note upon the spread of the European corn borer in Massachusetts and New York; N. Hollister, Note upon ovipositing by an Indian python at the National Zoological Park.

Formal communications: A symposium was held upon the subject, "What kind of characters distinguish a species from a subdivision of a species." The discussion was opened by Prof. A. S. Hitchcock, who was followed for specific groups by N. Hollister, Mammals; H. C. Oberholser, Birds; W. C. Kendall, Fishes; A. N. Caudell, Insects; Paul Bartsch, Mollusks; and S. F. Blake, Plants.

March 22, 1919—594th Meeting.[2]

Vice-President N. Hollister presided; 33 persons present.

Formal Communications: J. W. Gidley, Notice of a large canid from the Cumberland Cave deposits; A. C. Baker, Intermediates in the Aphididae and their relation to alternate hosts; R. H. True, Bernardin de Sainte Pierre as a plant ecologist.

April 5, 1919—595th Meeting.[3]

President Smith presided; 55 persons present.

Informal communications: W. P. Taylor, Note upon the Olympic Elk in the State of Washington; A. S. Hitchcock, Exhibit of recent botanical works, A Monographic Study of the Hawaiian Species of Lobelioideae, by Prof. J. F. Rock; and Rumphius's Flora Amboinensis by Prof. E. D. Merrill; H. C. Oberholser, Note upon ornithological activities in 1918; T. S. Palmer, Note upon a rare New Caledonian bird, the Kagu (*Rhynochetos jubatus*); T. S. Palmer, Note upon the number of Bison in North America; Alexander Wetmore, Notes upon the shape and size of the pupils of the eyes of birds; N. Dearborn, Note upon the choice of nesting place of a pair of blue birds; H. M. Smith, Exhibition of drawings of the deep sea fish, *Gargariscus semidatus.*

Formal communications: Agnes Chase, Oil grasses and their

[1] Abstract in Journ. Washington Acad. Sci., vol. 9, pp. 234-238, April 19, 1919.
[2] Abstract in Journ. Washington Acad. Sci., vol 9, pp. 287, 288, May 19, 1919.
[3] Abstract in Journ. Washington Acad. Sci., vol. 9, pp. 355, 356, June 19, 1919.

use in perfumery; R. M. Anderson, Recent zoological exploration in the Western Arctic.

April 19, 1919—596th Meeting.[1]

Vice-President Hollister presided; 43 persons present.

New member elected: H. H. Lane.

Informal communications: W. P. Taylor, Note upon the organization of the American Society of Mammalogists; T. S. Palmer, Note upon ornithological activities in Germany during the war; L. O. Howard, Note upon the introduction of an American wasp, the horse guard, into Algeria; A. S. Hitchcock, Note upon the representation of biology in the National Council of Research.

Formal communications: Walter P. Taylor, Notes upon Dr. J. G. Cooper's scientific investigations on the Pacific Coast; G. W. Field, Observations on the Heath Hen, with lantern slide illustrations; Albert Mann, Woods Hole Diatoms, with lantern slide illustrations.

May 3, 1919—597th Meeting.[2]

Vice-President Bailey presided; 30 persons present.

Informal communications: Alexander Wetmore, Note on the feeding of Purple Finches on plant galls; L. O. Howard, Note on the expected arrival of the seventeen-year cicada; Edith R. Keleher, William Palmer, and Alexander Wetmore gave notes upon the chimney-building habits of the cicada nymph; R. W. Shufeldt, Note and exhibition, a second double-headed tortoise and double-headed snake; E. W. Nelson, Note upon a double-headed snake.

Formal communications: Alexander Wetmore, Notes on the Brown Pelican, as observed on Pelican Island, Florida, illustrated with lantern slides; Vernon Bailey, The explorations of Maximilian, Prince of Wied, on the upper Missouri in 1833.

May 17, 1919—598th Meeting.[3]

President Smith presided; 45 persons present.

Informal communications: W. R. Maxon, Exhibition and remarks on a fungus of the genus *Mitromyces;* W. R. Maxon, Query, Do both sexes of birds sing? Reply by H. C. Oberholser and

[1]Abstract in Journ. Washington Acad. Sci., vol. 9, pp. 419, 420, August 19, 1919.
[2]Abstract in Journ. Washington Acad. Sci., vol. 9, pp. 418, 419, August 19, 1919.
[3]Abstract in Journ. Washington Acad. Sci., vol. 9, p. 420, August 19, 1919.

William Palmer; F. V. Coville, Note on a vine 1,134 feet in length; A. S. Hitchcock and W. E. Safford, Comments upon the foregoing; A. S. Hitchcock, Note on the forthcoming Flora of the District of Columbia and vicinity; I. N. Hoffman, Note on the reported observation of whooping cranes in Texas; William Palmer, Remarks on the causes and biological effects of tidal conditions in Chesapeake Bay; H. M. Smith, Exhibition and note, an exceedingly small fish, *Lucania ornata*, from a fresh water lake in Georgia.

Formal communications: F. V. Coville, The strange story of the Box Huckleberry; W. E. Safford, Plants used in the arts and industries of ancient America.

October 18, 1919—599th Meeting.[1]

Vice-President Hollister presided; 36 persons present.

Informal communications: R. W. Shufeldt, Exhibition of living specimens of young and adult Wood Tortoises (*Clemmys insculpta*); William Palmer, Notes on the local occurrence of the Wood Tortoise; Paul Bartsch, Notes on the tameness of some Red-breasted Nuthatches in New Hampshire.

Formal communications: J. S. Gutsell, Use of selective screens in studies of oyster larvae; T. S. Palmer, The discoverer of the toothed birds of Kansas; Paul Bartsch, Results of Cerion breeding.

November 1, 1919—600th Meeting.[2]

President Smith presided; 55 persons present.

New members elected: Federated Malay States Museums; Ellsworth Killip.

Informal communications: H. M. Smith, An announcement of the unveiling of a monument to Surgeon-General George Miller Sternberg, who was President of this Society in 1895 and 1896; T. S. Palmer, (1) Notice of the forthcoming meeting of the American Ornithologists' Union in New York; (2) Note on the grave of Dr. David Hosack, in Marble Cemetery, New York; (3) Note on the marking of the grave of Rafinesque in Philadelphia; C. W. Stiles, (1) Note on the grave of Dr. E. A. De Schweinitz in Winston-Salem, N. C.; (2) Note on the occurrence of the manatee (*Trichechus manatus*) near Wilmington, N. C.;

[1] Abstract in Journ. Washington Acad. Sci., vol. 9, pp. 656, 657, December 19, 1919.

[2] Abstract in Journ. Washington Acad. Sci. vol. 9, pp. 657–659, December 19, 1919.

H. M. Smith, (1) Exhibition of a publication of the Bureau of Fisheries, on the Freshwater Mussels and the Mussel Industry of the United States, by R. E. Coker; (2) Note on the proposed cruise of the U. S. Fisheries Steamer "Albatross"; (2) Note on the finding of a bearded hair seal (*Erignathus barbatus*) on St. George Island, Alaska; Rear Admiral Baird, Exhibition of a collection of seaweeds made by Mrs. Baird under the direction of the elder Verrill 30 years ago.

Formal communications: President Smith announced that the present meeting was to be celebrated as the 6th centenary meeting. A letter was read from Dr. F. A. Lucas, former President. The papers presented were: Dr. L. O. Howard, Early days of the Society; Dr. W. H. Dall, Reminiscences; Dr. T. S. Palmer, The Proceedings.

November 15, 1919—601st Meeting.[1]

Vice-President Bailey presided; 26 persons present.

Informal communications: L. O. Howard, (1) Presented a letter from Dr. B. W. Evermann, a former President, apropos of the 6th Centenary; (2) Announced a meeting of the Engineering Council; R. W. Shufeldt exhibited living young of the southern soft-shelled turtle (*Amyda ferox*) and gave notes upon this group of turtles; W. H. Osgood offered notes upon the recent meeting of the American Ornithologists' Union; Alexander Wetmore, Notes upon the strutting attitudes of the male sage grouse, *Centrocercus urophasianus.*

Formal communications: N. Hollister, Relative abundance of water fowl in Wisconsin; Alexander Wetmore, A peculiar habit of grebes, with exhibition of specimens; E. O. Wooton, Notes on a short visit to Tamaulipas.

November 29, 1919—602d Meeting.[2]

President H. M. Smith presided; 30 persons present.

Informal communications: R. E. Coker, exhibition of a publication of the Bureau of Fisheries, The Life History of the Blue Crab, by E. P. Churchill; H. C. Oberholser, (1) Note on the appearance of Vol. 1, No. 1, Journal of Mammalogy; (2) Note on a new contribution to ornithological methods in a paper en-

[1]Abstract in Journ. Washington Acad. Sci., vol. 10, pp. 26, 27, January 4, 1920.
[2]Abstract in Journ. Washington Acad. Sci., vol. 10, pp. 145, 146, March 4, 1920.

titled Bird Banding by Systematic Trapping, by S. Prentiss Baldwin; H. M. Smith, Note on a new nesting place for swans; T. S. Palmer, (1) Note on the present status of Osborn's Caribou; (2) Exhibition of a copy of a new journal, Journal of the Wild Bird Investigation Society; (3) Note on a list of the mammals of Siam, by Nils Gyldenstolpe.

Formal communications: V. Bailey, The Bean Mouse of Lewis and Clark, Maximilian and others, illustrated by living specimens of this and other small rodents of North Dakota; A. D. Hopkins, The Bio-Climatic Law.

December 13, 1919—603d Meeting.[1]

FORTIETH ANNUAL MEETING.

President H. M. Smith presided; 21 persons present.

The regular order was suspended, and Dr. T. S. Palmer presented Mr. W. L. Sclater of London, Editor of the Ibis, a Recorder of the Zoological Record, and a prime mover in behalf of the "Systema Avium." Mr. Sclater addressed the Society upon the need for an authoritative list of birds, and also upon the difficulties encountered during the war in editing the Zoological Record.

The regular order being resumed, Annual reports of Officers and Committees were received.

The officers elected for the year 1920 were:

President: A. D. Hopkins.

Vice-Presidents: Ned Hollister, Vernon Bailey, A. S. Hitchcock, J. W. Gidley.

Recording Secretary: A. A. Doolittle.

Corresponding Secretary: Alexander Wetmore.

Treasurer: Ned Dearborn.

Members of the Council: William Palmer, H. C. Oberholser, E. A. Goldman, H. H. T. Jackson, S. A. Rohwer.

President A. D. Hopkins was nominated as one of the Vice-Presidents of the Washington Academy of Sciences.

The appointment of the Standing Committees for the year 1920 was deferred.

[1]Abstract in Journ. Washington Acad. Sci., vol. 10, pp. 146, 147, March 4, 1920.

ERRATA.

Page 18, line 17, for *Cochlostyla sarcinosa negrosa,*
read *Cochlostyla sarcinosa* **negrosa.**
Page 18, line 19, for *Cochlostyla sarcinosa pandana.*
read *Cochlostyla sarcinosa* **pandana.**
Page 235, line 20, for **noctitherus,** read **noctithera.**
Page 235, line 21, for *vociferus vociferus.*
read *vocifera vocifera.*
Page 269, line 25, for 22,775, read 22,765.
Page 270, line 3, for 22,776, read 22,766.
Page 270, line 4 (from bottom), for 22,777, read 22,767.

Vol. 32, pp. 1–4 February 14, 1919

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

ONE NEW GENUS AND TWO NEW SPECIES OF ANTHOMYIIDAE FROM THE VICINITY OF WASHINGTON, D. C. (DIPTERA).

BY J. R. MALLOCH.

The two insect species described in this paper were sent to me for identification over a year ago from the collection of the United States Bureau of Biological Survey at my request for material to assist me in drawing up generic keys to the Anthomyiidae of North America and the descriptions are put forward at this time in order to pave the way for further contributions of a synoptic nature. The types have been returned to Washington.

Macateeia, gen. nov.

Generic Characters. Female.—Head oblong in profile, distinctly longer than high; orbits extending farther beyond eyes than height of cheek; frontal orbits with weak bristles, all of which except the upper 3 on each side are directed mesad; interfrontal cruciate bristles well developed; antennae shorter than face; arista pubescent; vibrissal angle with numerous hairs and 1 distinct vibrissa on each side; hairs on cheek confined to lower margins; eyes bare, a little higher than long. Thoracic chaetotaxy as in *Hylemyia*. Abdomen tapered apically; ovipositor chitinized, glossy black, tapered apically, the extreme apex, when seen in profile, with a slightly wedge-shaped excision. Legs rather stout, the femora noticeably so; hind tibia with 2 very short, stout, curved, thorn-like spurs on anterior side at apex. Wing venation as in *Hylemyia*.

Type of genus, **Macateeia protuberans**, sp. n.

Female.—Black, densely gray pruinose. Head reddish testaceous, densely whitish gray pruinose, occiput dark gray; antennae and arista black; proboscis fuscous; palpi testaceous yellow. Thorax, seen from behind, with 3 broad indistinct gray vittae, the larger bristles with dark brown dots at their bases. Abdomen unicolorous gray, with very faint indications of darker dots at bases of bristles. Legs black. Wings slightly yellowish. Calyptra white. Halteres yellow.

Length of head at base of antennae about one and one-fourth times

that of its height posteriorly; frons in front of anterior ocellus occupying about two-fifths the width of head, each orbit at this point over half as wide as interfrontalia; viewed from above frons projects beyond eye half as far as length of latter, third antennal joint rounded at apex, about 1.5 as long as second; arista but little longer than antenna; proboscis slender, the apical portion as long as height of head. Presutural acrostichals consisting of one long pair of bristles, and a series of weak, paired hairs caudad of them; prealar bristle half as long as the one behind it; scutellum with 4 long bristles. Fore femur with long bristles on postero-dorsal, posterior, and postero-ventral surfaces; fore tibia with 1 posterior, 1 antero-dorsal, and 2 preapical bristles; mid femur with 1 or 2 bristles on antero- and postero-ventral surfaces near base, and the usual series on basal two-thirds and the preapical one on anterior surface; mid tibia with 1 anterior, 2 postero-dorsal, and 2 posterior bristles; hind femur with a series of long widely spaced bristles on the antero-ventral surface, and 2 or 3 weak ones on the postero-ventral; hind tibia with 2 antero-ventral, 3 or 4 antero-dorsal, and 3 or 4 postero-dorsal bristles; apex of posterior surface with several long setulose hairs; the apical curved thorns shorter than diameter of tibia. Costa with short setulae and no well-differentiated costal thorn; veins bare; last section of fourth vein about one and one-fourth as long as preceding section; outer cross-vein nearly straight.

Length, 5.5 mm.

Type locality, Suitland, Md., October 30, 1917, in flower of *Gentiana clausa* (W. L. McAtee). One specimen.

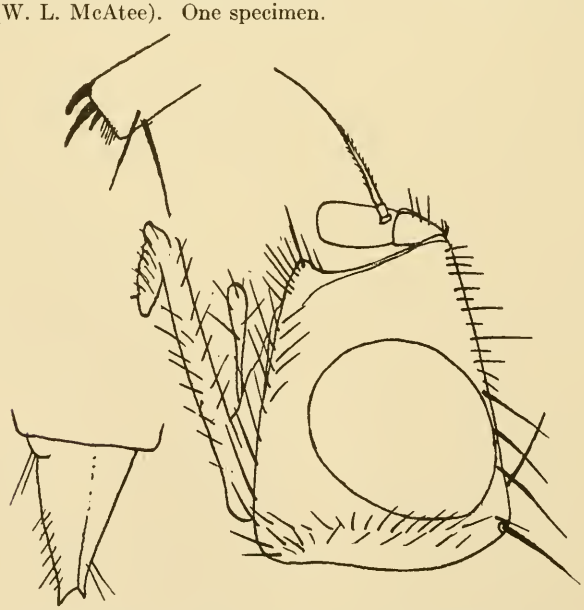


FIG. 1. *Macateeia protuberans* sp. n., female, head ; apex of hind tibia, anterior view ; and apex of abdomen, side view.

This genus is related to *Hammomyia* but the much more elongate head readily separates it from that and all other genera known to me. The genus belongs to the subfamily Anthomyiinae, but differs from most related genera in having no anteriorly directed supraorbital bristle, and I know of no other genus possessing the peculiar curved apical hind tibial spurs. An additional character for the separation of the genus from *Hammomyia* is found in the presence of the interfrontal cruciate bristle.

Phaonia winnemanae, sp. n.

Male.—Black, slightly shining. Frontal stripe brownish red, orbits with white pilosity; cheeks paler than frons; face gray ; antennae reddish testaceous, third joint except base blackish brown; arista reddish testaceous; palp reddish, slightly darkened at apices. Thorax rather distinctly quadrivittate when viewed from behind; humeri, lateral margins of disc posteriorly, scutellum, and regions surrounding both spiracles testaceous. Abdomen with dense brownish gray pruinescence and a distinct dorso-central dark stripe. Legs yellow testaceous. Wings yellowish, noticeably so at base. Calyptra and halteres yellow.

Eyes almost nude, separated at narrowest part of frons by a distance greater than width across posterior ocelli; orbits linear, not obliterating the rather wide interfrontalia; arista plumose to tip, the longest hairs very distinctly longer than width of third antennal joint; cheek at narrowest part slightly higher than width of third antennal joint; marginal bristles strong, all directed downward and slightly forward. Presutural acrostichals absent, 4–6 series of weak hairs between presutural dorso-centrals; 3 pairs of postsutural dorso-centrals present; prealar bristle nearly as long as the one behind it; scutellum with 4 strong and 2 weak basal marginal and 2 weak discal bristles. Fifth abdominal sternite with a large deep V-shaped notch in posterior margin. Fore tibia with a few short setulae on apical half of antero-dorsal surface, no posterior bristle at middle; mid tibia with 3 or 4 posterior bristles; hind femur with a complete series of bristles on antero-ventral surface and a few weak bristles on basal half of postero-ventral; hind tibia with 4 or 5 antero-ventral, 5 or 6 anterior, 2 or 3 antero-dorsal and 1 postero-dorsal bristles, and a series of small setulae on posterior surface. Outer cross-vein straight.

Length, 7 mm.

Type locality, Plummers Island, Md., June 17, 1906 (W. L. McAtee). One specimen.

This species resembles *pulvillata* Stein more closely than it does any other North American species known to me. It differs, however, from that species in having a series of bristles on the anterior surface of hind tibia in addition to those on the antero-ventral and antero-dorsal surfaces, the eyes hairy, and the frons much wider.

In some respects the species resembles *apicata* Johannsen and *pallidula* Coquillett. From the former it is readily separated by the entirely yellow

legs, more widely separated eyes, and the bristling of the hind tibiae; and from *pallidula*, by the longer-haired arista, black abdomen, and bristling of hind tibia.

The type specimen was labeled *proxima* Van der Wulp in Coquillett's writing, but that species differs in having the eyes less widely separated, palpi black, and tarsi fuscous, being much more like *apicata* than is the present species. The description of *proxima* lacks the details necessary to insure its identification

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THREE NEW SOUTH AMERICAN RIVER-CRABS.[1]

BY MARY J. RATHBUN.

The National Museum has acquired in recent years through the activities of the University of Michigan three new species of crabs from the fresh waters of the northernmost countries of South America.

Pseudothelphusa martensis, sp. nov.

Holotype.—Adult male, Cat. No. 53311, United States National Museum. Collected in the Santa Marta Mountains, Colombia, by M. A. Carriker, 1914, and given to the National Museum by the University of Michigan.

Measurements.—Male holotype, length of carapace on the median line 28.5 mm., width of carapace 52 mm., width between outer angles of orbits 29.3 mm., width of front above, between the eyes, 14.6 mm., width of front below 11.7 mm.

Description.—Front of carapace between the eyes not carinated above but bounded by a definite line roughened by low, flat tubercles. Outer margin of merus of third maxilliped forming an angle with the anterior margin. The species is allied to *P. bouvieri,*[2] from Santa Fé de Bogotá, but differs as follows: Front considerably wider in proportion to width of carapace, upper edge straighter, lower edge more deeply sinuous, and quadrilobate instead of trilobate, all the lobes reaching downward to the same transverse line; orbits more elongate in proportion to height; epigastric lobes nearer front and emphasized by a deep, transverse thumb-nail impression anteriorly; lateral cervical tooth larger, cervical suture continued quite to base of tooth; merus of outer maxilliped much smaller than in *P. bouvieri,* and much narrower than ischium; exognath reaches two-thirds length of ischium; margins of male abdomen more convex; appendages of first segment lack the large lobe on outer side in distal half.

Pseudothelphusa iturbei, sp. nov.

Holotype.—Adult male, Cat. No. 53310, United States National Mu-

[1] Published by permission of the Secretary of the Smithsonian Institution.

[2] Rathbun, Proc. U. S. Nat. Mus., vol. 21, 1898, pp. 518, 533 & 537, text-fig. 9; Nouv. Arch. Mus. Hist. Nat., Paris, vol. 7, 1905, pp. 274, 287, 289, pl. 13, fig. 5, text-fig. 81.

seum. Collected in Rio Guiare, near Caracas, Venezuela, by Dr. Juan Iturbe, August 4, 1918, and presented by him to the National Museum.

Measurements.—Male holotype, length of carapace on median line 40 mm., width of carapace 64 mm., width between outer angles of orbits 36.7, width of front above, between the eyes, 18.4 mm., width of front below 16.3 mm.

Description.—Near *P. garmani;*[1] the upper edge of the front, between the eyes, carinated and tuberculated, the outer margin of merus of maxilliped arcuate, and the exognath reduced to a stump. Differs from *P. garmani* in several particulars: In the absence of a giant tubercle on outer face of palm just between bases of fingers; upper edge of front in dorsal view a little arcuate or sloping backward from the median emargination, this edge, in *garmani*, being almost transverse; orbit in front view higher in outer half than in *garmani;* abdomen of male wider.

Potamocarcinus dunoonensis, sp. nov.

Holotype.—Adult female, Cat. No. 53312, United States National Museum. Collected at Dunoon, Demerara River, British Guiana, by E. N. Clarke, August 27, 1915, and given to the National Museum by the University of Michigan.

Measurements.—Female holotype, length of carapace on median line 47.8 mm., width of carapace 76 mm., width between outer angles of orbits 43 mm., width of front above, between the eyes, 20.1 mm., width of front below 16.7 mm.

Description.—Carapace very convex from front to back, much less so from side to side. Cervical suture straight. Lateral teeth or spines small, 23 behind, 8 or 9 before, the cervical suture. Upper margin of front nearly straight, median emargination broad and shallow, lobes sloping a little backward outwardly and rough with from 14 to 16 irregular tubercles; surface of front very uneven, inclined downward and backward; lower edge quadrilobate.

Maxillipeds very convex when closed, outer margins arcuate; merus subtriangular; exognath one-third as long as outer margin of ischium.

A conical sharp spine at inner angle of wrist; lower margin of larger propodus convex. Merus of legs roughened above with elongate tubercles; dactyli armed with slender spines.

[1] Proc. U. S. Nat. Mus., vol. 21, 1898, pp. 522, 534 and 537, text-fig. 14; Nouv. Arch. Mus. Hist. Nat., Paris, vol. 7, 1905, p. 298, text-fig. 91.

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MUTANDA ORNITHOLOGICA.

V.

BY HARRY C. OBERHOLSER.

The names of the following woodpeckers apparently must be changed. Notes on the names of various other species will be found in previous installments of the present series of papers.[1]

Family PICIDAE.

Iyngipicus pygmaeus (Vigors).

Another name must be used for the Himalayan woodpecker commonly known as *Iyngipicus pygmaeus*, since its original combination, *Picus pygmaeus* Vigors[2] is preoccupied by *Picus pygmaeus* Lichtenstein,[3] which is now known as *Picumnus pygmaeus* Lichtenstein. The determination of the proper name now to be used for this species involves some complication. The earliest subsequent designation is *Dendrocopus moluccensis* Hodgson,[4] but this is a nomen nudum where first proposed. The *Picus moluccensis* of Gray,[5] if not a mere misidentification of *Picus moluccensis* Gmelin,[6] is of course preoccupied by the latter, which is the same as *Iyngipicus auritus* (Eyton). The *Picus zizuki* of Gray, 1846,[7] is a misidentification of the Nepal bird with *Picus kizuki* Temminck,[8] and is not the same as *Picus zizuki* Gray, 1845,[9] which is *Picus kizuki* Temminck (=*Yungipicus kizuki* [Temminck]) wrongly spelled.

The earliest tenable name of this woodpecker, therefore, seems to be

[1] For the four previous articles, *cf.* Proc. Biol. Soc. Wash., XXX, March 31, 1917, pp. 75–76; Proc. Biol. Soc. Wash., XXX, July 27, 1917, pp. 125–126; Proc. Biol. Soc. Wash., XXXI, May 16, 1918, pp. 47–49; and Proc. Biol. Soc. Wash., XXXI, November 29, 1918, pp. 125–126.

[2] Proc. Zool. Soc. Lond., 1831 (April 6, 1831), p. 44 (Himalaya Mountains).

[3] Verz. Doubl., 1823, pp. 11, 12, note (Brazil).

[4] Gray's Zool. Misc., 1844, p. 85.

[5] Genera Birds, I, 1845, p. 435.

[6] Syst. Nat., I, i, 1788, p. 439 (Molucca Islands).

[7] Cat. Mamm. Birds Nepal Pres. Hodgson, 1846, p. 116 (Nepal).

[8] Nouv. Rec. Planch. Col. d'Ois., IV, livr. 99, 1836, pl. 585 and text.

[9] Genera Birds, II, 1845, p. 435.

Picus mitchellii Malherbe;[1] and since the original spelling of the generic name *Iyngipicus* is *Yungipicus*,[2] the species at present under consideration should stand as *Yungipicus mitchellii* (Malherbe).

Iyngipicus auritus (Eyton).

An earlier name for *Tripsurus auritus* Eyton,[3] now known as *Iyngipicus auritus*, is found in *Picus moluccensis* Gmelin,[4] heretofore rejected evidently because of its erroneous locality. Since, as already noted under the previous species, the generic name *Iyngipicus* should be written *Yungipicus*, the present bird should be known as *Yungipicus moluccensis* (Gmelin); and we designate Malacca as the type locality.

Dendropicos minutus (Temminck).

The *Picus minutus* of Temminck[5] is rendered untenable by *Picus minutus* Latham,[6] which is a synonym of *Picumnus spilogaster* Sundevall. As there is no other name available for this species, we propose to call it **Dendropicos elachus** nobis.

Campethera punctata (Valenciennes).

The name *Campethera punctata*, used for an African woodpecker, is untenable, because its basis, the *Picus punctatus* of Valenciennes,[7] is invalidated by *Picus punctatus* Vieillot,[8] now regarded as a synonym of *Thripias namaquus* (Lichtenstein). The next available name is *Picus punctuligerus* Wagler,[9] and the species will, therefore, now stand as *Campethera punctuligera* (Wagler).

Gecinus striolatus (Blyth).

The *Picus striolatus* of Blyth,[10] now employed for an Indian woodpecker in the combination *Gecinus striolatus*, must be retired on account of the earlier *Picus striolatus* Lesson,[11] which is identical with *Veniliornis passerinus* (Linnaeus). Since the *Brachylophus xanthopygaeus* of Hodgson[12] is a nomen nudum, the earliest tenable name for the species becomes *Gecinus xanthopygius* Bonaparte.[13] Dr. Ernst Hartert[14] has already called attention to the fact that the Linnaean generic name *Picus* has for its type *Picus viridis* Linnaeus, and therefore displaces *Gecinus* Boie. The proper name for the species under present consideration will, therefore, become *Picus xanthopygius* (Bonaparte).

[1] Rev. et Mag. Zool., 1849, p. 530 (Nepal).

[2] Bonaparte, Ateneo Italiano, II, No. 8, May, 1854, p. 123.

[3] Ann. and Mag. Nat. Hist., ser. I, XVI, 1845, p. 229 (Malacca, Malay Peninsula).

[4] Syst. Nat., I, i, 1788, p. 439 (Molucca Islands).

[5] Nouv. Rec. Planch. Col. d'Ois., IV, livr. 33, April, 1823, pl. 197, fig. 2 and text (Senegal).

[6] Index Ornith., I, 1790, p. 243 (Cayenne).

[7] Dict. Sci. Nat., XL, 1826, p. 171 (Senegal).

[8] Nouv. Dict. d'Hist. Nat., XXVI, 1818, p. 89 (Africa).

[9] Syst. Avium, 1827, Picus sp. 36 [p. 27] (Senegambia).

[10] Journ. Asiatic Soc. Bengal, XII, part 2, 1843, p. 1000 (Himalayas and central India).

[11] Traité d'Ornith., I, 1831, p. 226 (Cayenne).

[12] Gray's Zool. Misc., 1844, p. 85 (Nepal).

[13] Consp. Avium, I, 1850, p. 127 (Java).

[14] Vögel Paläarkt. Fauna, Heft VII (Band II, Heft I), February, 1912, p. 889.

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THE WISCONSIN NAPAEOZAPUS.

BY HARTLEY H. T. JACKSON.

During the summer of 1917, while conducting field work in Wisconsin for the U. S. Biological Survey, which is cooperating with the Wisconsin Geological and Natural History Survey in a study of the life-zones and terrestrial vertebrates of that State, the writer collected specimens of the genus *Napaeozapus* at three different localities. These were the first members of this genus to be found in Wisconsin. The geographic range of the genus was extended still farther to the southwest last summer (1918), when I trapped one on the west side of the Black River, 2 miles west of Withee, Wisconsin.

A critical examination of these specimens is hardly necessary to show that they represent a clearly defined and unrecognized form. It may be identified by the following description:

Napaeozapus insignis frutectanus,[1] subsp. nov.

Type specimen.—Adult ♂, skin and skull, No. 227,349, U. S. National Museum, Biological Survey Collection; from Crescent Lake, Oneida County, Wisconsin; collected September 6, 1917, by Hartley H. T. Jackson. Original number 896.

Geographic range.—Known only from northern Wisconsin.

General characters.—Smaller than *Napaeozapus insignis abietorum,* with shorter hind foot; about the size of *Napaeozapus insignis insignis;* different from both in color. Compared with either *N. i. insignis* or *N. i. abietorum* the dorsal area (stripe) is more sharply defined (intermixed with more blackish-hairs); color of sides duller and paler, though showing more distinctly the scantily intermixed coarse blackish hairs; border of ears appearing distinctly more whitish, narrowly edged with between pinkish buff and pale pinkish buff (as compared to cinnamon in *insignis* and *abietorum);* nose and face more blackish; white portion of terminus of tail averaging shorter.

[1] Latin, an inhabitant of shrubbery or bushy places.

Color.—Broad dorsal stripe extending from snout to base of tail clay color[1] much mixed with blackish, decidely darker than sides and remainder of upper parts which are clay color scantily mixed with coarse blackish hairs; ventral parts from chin to base of tail creamy white; ears essentially like dorsal stripe, narrowly edged with between pinkish buff and pale pinkish buff; tail distinctly bicolor nearly to tip, between olive-brown and chaetura drab above, whitish below, the terminal twenty millimeters whitish both above and below.

Skull.—About the size and proportions of that of *Napaeozapus insignis abietorum* (as represented by specimens from Quebec); molar row longer and heavier than in *Napaeozapus insignis insignis* and interorbital region much more constricted (as in *abietorum*); postpalatal notch shallower than in either *N. i. insignis* or *N. i. abietorum*, the anterior border about opposite the middle or posterior half of last molar (in both *insignis* and *abietorum* the anterior border of this is about opposite, or anterior to, anterior edge of this tooth); palatal shelf greater in antero-posterior diameter than in either *insignis* or *abietorum*.

Measurements.—Type-specimen (adult male): Total length, 235; tail vertebrae, 145; hind foot, 31. *Skull*: Type-specimen (adult male; teeth slightly worn): Condylobasal length, 21.1; zygomatic breadth, 11.9; mastoidal breadth, 10.7; interorbital constriction, 4.5; posterior border of incisors to anterior edge of mesopterygoid space, 9.1; anterior edge of mesopterygoid space to foramen magnum, 7.8; molar tooth row, 3.9.

Remarks.—The Wisconsin representative of *Napaeozapus* is more clearly defined in external characters from true *insignis* than either *N. i. abietorum* or *N. i. roanensis*. Its pale dull colors, more clearly enunciated dorsal stripe, and pale edges of the ears separate it at a glance from all other known subspecies. The specimens were trapped in the same habitat with *Zapus hudsonius hudsonius*, usually grassy brushland or second growth (predominantly alder or paper birch, sometimes mixed timber of arbor vitae, maple, aspen, and birch) along creeks. The type-specimen was trapped in a grassy paper-birch thicket near the bank of Crescent Creek.

Specimens examined.—Seven from the following localities in Wisconsin: Crescent Lake, Oneida County, 1; Kelley Lake, Oconto County, 2; Lakewood, 3; Withee, 1.

[1]Ridgway, R., Color standards and color nomenclature, 1912.

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DESCRIPTION OF A NEW RACE OF THE WESTERN GULL

BY JONATHAN DWIGHT, M. D.

The breeding range of the Western Gull is singularly long and narrow, extending north and south some 1,500 miles along the Pacific Coast, but it is scarcely wider than the rocky islands lying off the coasts of Washington, Oregon, California and Lower California which the birds frequent. It is therefore not at all surprising that it is separable into two races, the southern one having a darker mantle with less gray on the primaries. Audubon described *Larus occidentalis* in 1839 from two specimens sent him by his friend, Dr. J. K. Townsend, one an adult male, the other an immature bird at least a year old, both taken at Cape Disappointment, mouth of the Columbia River, Washington. October 7th and 6th respectively, 1836. The type was once in the U. S. National Museum collection, No. 2767, so I am informed by Dr. Chas. W. Richmond, but it can not be found there to-day; hence Audubon's description must determine which of the two races he had in hand. It is perfectly evident that he did not have the dark southern race, for although his description is faulty in some respects it fits fairly well the birds that breed to-day on the islands off the coasts of Washington and Oregon. Therefore it is the southern race with the dark mantle that requires a new name.

Larus occidentalis livens, subsp. nov.

Type, ♂ adult, No. 3378, L. C. Sanford collection, San Jose Island, Lower California, April 26, 1912. Collected by W. W. Brown, Jr. Wing, 420 mm.; tail, 165; tarsus, 70; middle toe without claw, 62; culmen, 55; depth of bill at base, 21; at angle, 22.

Subspecific characters.—Similar to *Larus occidentalis occidentalis,* but mantle a darker plumbeous or deep neutral instead of plain neutral gray and usually four outer primaries, instead of two, black basally without gray areas.

Description.—Pure white except mantle and wings. Head, neck, lower parts, tail, its coverts, lining (except for cinereous primary coverts) and edge of wing, tips of primaries, secondaries and tertiaries and a mirror on first primary white ; mantle including whole outer surface of wing and primary coverts dark plumbeous to neutral gray ; four outer primaries black, the fifth showing gray wedges on both webs nearly to tip, with the black reduced to a subterminal band on sixth, and the gray paler, remaining primaries gray with broad white tips. Bill (in life) lemon yellow with a red spot on lower mandible between angle and tip. Tarsi and feet (in life) lemon yellow. Iris, hazel-brown.

Measurements (in millimeters).—Male (10 adults): wing, 402–445 (416); tail, 154–167 (162); tarsus, 67–72 (69); middle toe without claw, 58–62 (60); exposed culmen, 52–59 (55); depth of bill at base, 18–22 (20); at angle, 20–23 (21).

Female (8 adults): wing, 380–395 (389); tail, 147–153 (150); tarsus, 61–65 (63); toe, 52–58 (55); culmen, 46–53 (50); depth at base, 16–18 (17); at angle, 18–20 (19).

Remarks.—While upwards of fifty specimens of the two races have been examined, so many of them are either young, not fully adult, in moult, unsexed or evidently wrongly sexed by inaccurate collectors that not more than two-thirds of this material is wholly satisfactory. With a larger series from southern localities, *livens* may prove to be a somewhat larger race, although specimens of typical *occidentalis* from Oregon are quite as large as the few birds examined from Lower California.

The race *livens* is found breeding on both coasts of Lower California, the Santa Barbara Islands and north to the Farallon Islands. Specimens from the Farallones are fairly typical while, on the other hand, a bird taken on July 20 at Trinidad, California, is the pale-mantled *occidentalis,* like those from still farther north.

There are reasons for suspecting that Audubon's specimens of *occidentalis* were Herring Gulls, possibly *vegæ,* but it would be difficult to prove this. His characters of bill, color of mantle and iris and pattern of primaries fit *livens,* although the larger size and flesh-colored feet suggest *vegæ.* Both forms of *occidentalis* have yellow feet (the tarsus of the type of *livens* is recorded by the collector as "lemon yellow") but the color of feet in the gulls has caused endless trouble and it is unsafe to draw conclusions from dried specimens as to what the color was in life. It seems to me the discrepancies in Audubon's description do not justify the discarding of his name *occidentalis* for the Western Gull. Apparently Schlegel (Mus. Pays-Bas, VI, 1863, p. 15) was the first writer to correctly describe the species as having yellow feet.

In the natal down, juvenal, *first winter* and first nuptial stages of plumages

the two races are hardly to be distinguished although occasionally at the first prenuptial moult a few tell-tale gray feathers may appear in the mantle. At the first postnuptial moult, the wholly brownish-black primaries of the first winter are reassumed as well as much of the brown, mottled plumage of the body and wing surfaces, but there are usually more or less gray feathers of the mantle which are diagnostic of the race to which the specimen belongs, and the tail as a rule has more white in it ; the black bill of the first winter has now become partly pale basally and the whole bird is noticeably whiter in the *second winter* plumage. At the second prenuptial moult much of the white plumage of the head, neck and lower parts is assumed and more gray creeps into the mantle, so that some specimens resemble adults except for the wings and tail. There is no evidence that any birds at the first postnuptial moult acquire the jet black primaries with white tips and a white sub-terminal spot or mirror on the distal primary, but nearly all individuals seem to acquire them at the second postnuptial. Therefore birds in their *third winter* may be considered as fully adult although some of them may show evidences of immaturity by primaries with small or imperfect mirrors and by tail-feathers touched with black. The size and shape of the mirror on the distal varies greatly in adults and sometimes a small spot develops on the next.

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CRITICAL REMARKS ON PHILIPPINE LANDSHELLS WITH DESCRIPTIONS OF NEW FORMS.

BY PAUL BARTSCH.[1]

The present paper embraces descriptions of new forms of Philippine Island landshells and a discussion of involved nomenclatorial problems concerning some of the names bestowed upon species long ago. The facts presented were brought out in the examination of material sent to the United States National Museum for determination, chiefly by Mr. Walter F. Webb, of Rochester, N. Y., whose indefatigable efforts in the Philippine field are rapidly increasing our knowledge of the mollusk fauna of that region. Other forms were transmitted by Mr. Gilbert S. Perez, Industrial Supervisor, at Lucena, in Tayabas, Luzon, while still others are the product of the late Colonel Edgar A. Mearns' collecting in the Philippine Islands, and one new form was the gift of Mr. Wm. H. Weeks, of Brooklyn, N. Y.

The types of all the new material are in the United States National Museum, as well as additional representative specimens. These were donated by the gentlemen above mentioned.

Hemiglypta webbi, new species.

Shell dark horn colored, broadly conic, very thin, with strongly carinated periphery. Upper surface of the whorls moderately rounded. The first half turn marked by strong wavy axial wrinkles, which is succeeded by a half turn that is finely wrinkled; from there on, the axial sculpture consists of fine retractively slanting, wavy threads, which are separated by spaces about as wide as the threads. The spiral sculpture consists of fine incised lines which break the axial threads into a series of slender elongated tubercles having their long axis parallel with the axial threads.

[1]Published by permission of the Secretary of the Smithsonian Institution.

Suture feebly impressed. Periphery of the last whorl strongly carinated. Base evenly, gently rounded with a decided umbilical depression and a slender perforation which is about one-third as wide as the umbilical callus. Aperture oval, decidely angulated at the periphery; lip but slightly thickened; columella strongly reflected at its insertion where it forms a narrow callus; parietal wall glazed with a thin callus.

The type and two specimens of this species, Cat. No. 219,038, U. S. N. M., donated by Mr. Webb, come from La Union, Davao, Mindanao. The type has 5.9 whorls and measures: altitude, 21.2 mm.; greater diameter, 35.9 mm.; lesser diameter, 31.6 mm. Another specimen, Cat. No. 256,242, U. S. N. M., was collected by Dr. E. A. Mearns at Sulug on the east shore of the Gulf of Davao, Mindanao.

Trochomorpha repanda pagbilaoensis, new subspecies.

Shell resembling *Trochomorpha repanda repanda* Möllendorff in coloration but less shiny and decidely smaller and a trifle more elevated. The upper surface of the whorls is marked by closely and regularly spaced, finely incised, wavy spiral lines in the present subspecies, while in *Trochomorpha repanda repanda* Möllendorff, the incised spiral markings are confined to the upper surface of the early whorls and they are extremely feeble. The under surface of the present subspecies is marked by numerous well incised spiral lines which are much stronger than those that mark the under surface of *Trochomorpha repanda repanda* Möllendorff. In the strength of the spiral markings of the under surface, the present subspecies appears to stand about half way between *Trochomorpha repanda repanda* Möllendorff and *Trochomorpha repanda candida* Möllendorff.

The type and another specimen of the present form, Cat. No. 310,053, U. S. N. M., were collected by Mr. Gilbert Perez, on the Greater Pagbilao Island, off the west coast of Tayabas, Central Luzon. The type has 5.5 whorls and measures: altitude, 4.5 mm.; greater diameter, 12.5 mm.; lesser diameter, 10.8 mm. *Trochomorpha repanda repanda* Möllendorff was described from Montalban, Luzon, while *Trochomorpha repanda candida* comes from Marinduque Island.

Cochlostyla fulgetrum tayasana, new subspecies.

In 1840 Broderip defined *Bulinus fulgetrum* on page 119 of the Proceedings of the Zoological Society of London. Here he describes varieties a to k. Of these varieties, a, b, e, f and h are listed from the Island of Negros, c, d and g from the Island of Guimaras and i and k from the Island of Panay. *Cochlostyla fulgetrum fulgetrum* in the restricted sense has been fixed upon the shells of Negros and other designations have been applied to those from Guimaras and Panay.

The Isaac Lea collection in the U. S. National Museum contains four specimens, two adult and two immature, which are cotypes gathered by Cuming on the Island of Negros. These agree perfectly in outline and coloration with the specimens from Cabancalan on the west side of the north coast and others from Escalante on the east side of the north coast

of Negros. We may therefore assume the north shore of Negros to be the home of *Cochlostyla fulgetrum fulgetrum* Broderip.

The present sending from Tayasan, which lies on the middle of the east coast of Negros, presents shells which are much more slender, therefore taller than the typical *Cochlostyla fulgetrum fulgetrum*. The ground color, also, is olive green, while in *Cochlostyla fulgetrum fulgetrum* it tends to yellow. Occasional specimens of both races have a pale reddish brown ground color. A brown peripheral band may be present or absent in both. It is not surprising that the specimens of the north and east coast should be different for the two regions are separated by high mountains. It is without hesitancy, therefore, that the name *Cochlostyla fulgetrum tayasana* is now applied to the race from Tayasan, which will probably be found to extend over the eastern portion of Negros Oriental. The type and four specimens form Cat. No. 219,037, U. S. N. M., and were donated by Mr. Webb.

Cochlostyla nimbosa antiqua, new subspecies.

Broderip, in describing *Bulinus nimbosus* in the Proceedings of the Zoological Society of London, 1840, page 121, defines four varieties. Varieties a, b and c have the ground color brown, and come from the Island of Negros. The variety d, on the other hand, has a pale yellow ground color and comes from the Island of Panay. In spite of the fact that so many names have been bestowed upon Philippine *Cochlostylas*, no one appears to have separated these two races, which are quite distinct. Since Reeve has figured the dark colored form from the Island of Negros under the name of *Bulimus nimbosus*, Conchologia Iconica, plate 4, figure 17, we may consider the name restricted to this form, and I now give the name *Cochlostyla nimbosa antiqua* to the race from the Island of Panay. The type and two specimens received from Mr. Webb are entered: Cat. No. 310,072, U. S. N. M.

The group of *Cochlostyla sarcinosa* is sadly in need of revision. The name is usually credited to Ferussac, but there while Ferussac used the name *sarcinosa* in 1822 in his "Tableaux systematiques des Animaux Mollusques," on page 47, number 323, the name as here applied has no status for it is a *nomen nudem*. In literature one frequently finds the name given as dating from Ferussac-Deshayes "Histoire Naturelle Générale et Particulière des Mollusques Terrestres et Fluviatiles" on page 267 and figured on plate 169, figures 1 and 7, but unfortunately the plates did not bear any name when they were issued, and the text for the part embracing this species was not published until 1850. In the mean time (1840), Broderip in the Proceedings of the Zoological Society of London, pages 121–123, reported on Cuming's collection from the Philippines, *Helix* (*Cochlostyla*) *sarcinosa* with varieties a–g. Of these varieties, a and b are from the Island of Negros, c is from an unknown source, d is from the Island of Guimaras, e and f are from the Island of Masbate, and g is from an unknown locality. Subsequent authors have looked upon the globular shells from Masbate as the typical form and we may therefore restrict the name *Cochlostyla*

sarcinosa to the subspecies occurring upon that island, which will have to bear the name *Cochlostyla sarcinosa sarcinosa* Broderip.

In 1850, Deshayes in Ferussac's "Histoire Naturelle Générale et Particulière des Mollusques Terrestres et Fluviatiles," on page 316, bestowed the name *Helix turgens* upon a shell which is depicted on plate 108, figures 11 and 13. The locality cited in this case is "Philippine Islands." The figures, however, quite clearly show that this name should be attached to the shells from Guimaras Island and we may therefore restrict it to the members of that island, which should be called *Cochlostyla sarcinosa turgens* Deshayes.

The third of the *sarcinosa* group to receive a name were the shells from the northwestern portion of Negros, which were christened *Cochlostyla sarcinosa dictyonina* by von Möllendorff in the Abhandlungen der Naturforschenden Gesellschaft zu Görlitz in 1898, volume 22, page 136.

There are two additional races in the complex before us, which will require a name. The first of these comes from the south central coast of Negros and may be known as *Cochlostyla sarcinosa negrosa* new subspecies, while the second one comes from northwestern Panay, and may be known as *Cochlostyla sarcinosa pandana.*

Of these five races, four have a broad peripheral band which extends to the lip on the last whorl. Of these, *Cochlostyla sarcinosa sarcinosa* is the largest. It is a subglobular form with olive green ground color, and only weakly fenestrated with spiral and axial markings. It has a whitish zone of about the same width as the brown band immediately below the latter.

The new subspecies, *Cochlostyla sarcinosa negrosa,* approaches typical *Cochlostyla sarcinosa* in shape and ground coloration. It is, however, much more strongly marked by hydrophanous axial and spiral bands of white which gives to this race the fenestrated appearance characteristic of *Cochlostyla sarcinosa turgens.* The type of this race is Cat. No. 219,035, U. S. N. M. and comes from Tayasan, Negros.

The other two races are less broadly conic. *Cochlostyla sarcinosa turgens* from Panay is the most strongly fenestrated form. It is marked by spiral and axial bands of pale brown placed upon a pale olive ground color. These markings are particularly well developed on the base. *Cochlostyla sarcinosa dictyonina* Möllendorff is the darkest of all, resembling *C. sarcinosa turgens* in general color pattern, but having all the markings much intensified.

The fifth race, the one now christened *Cochlostyla sarcinosa pandana,* lacks the brown peripheral band on the last turn, although this is present in the suture on the early whorls. The type of this, Cat. No. 310,071, U. S. N. M., comes from Pandan, northwest Panay.

Leptopoma goniostoma cotabatensis, new subspecies.

Shell similar to *Leptopoma goniostoma* Sowerby having, however, the shoulders of the whorls more flattened and the peripheral keel less produced and the umbilicus more open. The aperture, too, is smaller and

more nearly circular. The present subspecies appears to occupy the lower Rio Grande Valley of Cotabato, Mindanao.

The type, Cat. No. 250,787, U. S. N. M., and a large series of additional specimens were collected by Dr. E. A. Mearns near the town of Cotabato.

Leptopoma goniostoma goniostoma comes from Misamis Province, on the north coast of Mindanao.

Leptopoma nitidum weeksi, new subspecies.

In September, 1918, I published in the Journal of the Washington Academy of Sciences a key to the subspecies of *Leptopoma nitidum* Sowerby of the Philippine Islands. The present subspecies is nearest related to the subspecies which I there called *Leptopoma nitidum anaitis* Bartsch. This differs from it in being more broadly conic and larger, likewise in having the spiral striations of the upper surface and the base more numerous and a little more closely crowded. Thirty-six specimens give the following average measurements altitude, 14.2 mm.; greater diameter, 13.9 mm., lesser diameter, 10.5 mm.

The type, Cat. No. 310,073, U. S. N. M., which comes from the Island of Bohol, measures: altitude, 14.1 mm.; greater diameter, 13.9 mm.; lesser diameter, 10.7 mm.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

MUTANDA ORNITHOLOGICA.

VI.

BY HARRY C. OBERHOLSER.

This is the sixth[1] in the writer's current series of papers on changes in the names of birds. It concerns species of Phasianidae, Scolopacidae, Cuculidae, Bucconidae and Alcedinidae.

Family PHASIANIDAE.

Francolinus chinensis (Müller).

The name *Francolinus chinensis* now proves to be untenable for the species to which it has been applied, since its basis, the *Tetrao chinensis* of Müller,[2] is rendered invalid by the previous *Tetrao chinensis* of Linnaeus,[3] which is *Excalfactoria chinensis* (Linnaeus). The proper name for this Chinese francolin becomes, therefore, *Francolinus pintadeanus* (Scopoli).[4]

Family SCOLOPACIDAE.

Totanus maculatus (Tunstall).

In proposing[5] the use of the name *Totanus maculatus* (Tunstall)[6] for the preoccupied *Scolopax fusca* Linnaeus,[7] we overlooked the previous change[8] of the name of this species to *Totanus erythropus* (Pallas),[9] to which fact Dr. E. Hartert has kindly directed our attention. The proper designation of the spotted redshank is, of course, *Totanus erythropus* (Pallas).

[1] For the five previous articles, *cf.* Proc. Biol. Soc. Wash., XXX, March 31, 1917, pp. 75–76; July 27, 1917, pp. 125–126; ibid., XXXI, May 16, 1918, pp. 47–49; November 29, 1918, pp. 125–126; ibid., XXXII, February 14, 1919, pp. 7–8.

[2] Vollständ. Natursyst. Suppl., 1776, p. 129 (China).

[3] Syst. Nat., ed. 12, I, 1766, p. 277 (China).

[4] *Tetrao pintadeanus* Scopoli, Delic. Flor. et Faun. Insubr., II, 1786, p. 93 (Isle de France).

[5] Proc. Biol. Soc. Wash., XXXI, May 16, 1918, p. 47.

[6] [*Scolopax*] *Maculata* Tunstall, Ornith. Brit., 1771, p. 3.

[7] Syst. Nat., ed. 12, I, 1766, p. 243.

[8] Richmond, Smithson. Misc. Coll., XLVII, pt. 3, Jan. 31, 1905, p. 347.

[9] *Scolopax erythropus* Pallas, Adumbrat., Vroeg's Cat. d'Ois., Quad., et d'Insectes, 1764, p. 6.

FAMILY CUCULIDAE.

Cuculus canorus minor Brehm.

Mr. Outram Bangs has called our attention to the fact that *Cuculus canorus minor* Brehm,[1] used by Dr. E. Hartert[2] for the form of *Cuculus canorus* inhabiting Spain, Morocco, Algeria, and Tunis, is preoccupied by *Cuculus minor* Gmelin,[3] now in use as *Coccyzus minor* (Gmelin). As there appears to be no tenable name available for *Cuculus canorus minor* Brehm, we take pleasure in calling it **Cuculus canorus bangsi,** nom. nov.

FAMILY BUCCONIDAE.

Monasa nigra (Müller).

The current name for the South American puff-bird known as *Monasa nigra* (Müller) must be changed, since its original combination, *Cuculus niger* Müller,[4] is rendered untenable by *Cuculus niger* Linnaeus,[5] a synonym of *Eudynamis honorata* (Linnaeus). Its proper name is *Monasa atra* (Boddaert), which is the *Cuculus ater* of Boddaert.[6]

FAMILY ALCEDINIDAE.

Alcedo grandis Blyth.

The Indian kingfisher commonly known as *Alcedo grandis* Blyth,[7] is in need of a new name, since its present title is invalidated by *Alcedo grandis* Gmelin,[8] which is now considered a synonym of *Jacamarops aurea* (Müller). As no other name is found to be available for *Alcedo grandis* Blyth, it may be known as **Alcedo megalia,** nom. nov.

[1] *Cuculus canorus minor* A. E. Brehm, Allgem. Deutsch. Naturh. Zeitung, Neue Folge, III, 1857 (1858), p. 444 (northern and central Spain).

[2] Vögel paläarkt. Fauna, Heft VII (Band II, 1), February, 1912, p. 947.

[3] Syst. Nat., I, pt. I, 1788, p. 411 (Cayenne).

[4] Vollständ. Natursyst. Suppl., 1776, p. 90 (Cayenne).

[5] Syst. Nat., ed. 12, I, 1766, p. 170 (Bengal, India).

[6] Tabl. Planch. Enlum. d'Hist. Nat., 1783, p. 30 (Cayenne).

[7] Journ. Asiatic Soc. Bengal, XIV, 1845, p. 190 (Darjiling, India).

[8] Syst. Nat., I, i, 1788, p. 458 (loc. ign.).

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

AN UNRECOGNIZED SHREW FROM WARREN ISLAND, ALASKA.

BY HARTLEY H. T. JACKSON.

A careful study of Alaskan shrews of the *obscurus* group in the collection of the Museum of Vertebrate Zoology, University of California, in connection with specimens of this group in the collection of the U. S. Biological Survey, shows that it is necessary to recognize by name those which inhabit Warren Island. I am indebted to Dr. Joseph Grinnell, Director of the Museum of Vertebrate Zoology, for the privilege of describing this shrew from the collection under his administration. It may be known by the following diagnosis:

Sorex obscurus malitiosus,[1] subsp. nov.

Type.—Adult ♀, skin and skull, No. 8401, Museum of Vertebrate Zoology, University of California; from east side of Warren Island, Alaska; collected May 21, 1909, by H. S. Swarth. Original number 7532.

General characters.—Similar in size and superficial appearance to *Sorex obscurus longicauda*. Skull slightly more flattened than that of *longicauda* of corresponding age, the lachrymal foramen smaller and superior portion of rostrum broader. Larger than *Sorex obscurus elassodon* with relatively larger feet; skull broader than that of *elassodon* with longer rostrum. Larger than *Sorex obscurus alascensis* with longer tail; skull larger than that of *alascensis*, more flattened and averaging broader interorbitally.

Color.—Type in fresh summer pelage: Essentially like specimens of *S. o. longicauda* in similar pelage. Upperparts about mummy brown[2] becoming a very trifle darker on the posterior parts, and paling gradually into a drabbish on the flanks; underparts smoke gray heavily washed and mixed with between drab and wood brown; tail bicolor, between olive-brown and sepia above, between buffy brown and tawny-olive below nearly

[1] Latin, full of wickedness, knavish.

[2] Ridgway, R., Color standards and color nomenclature, 1912.

to tip. *Winter pelage:* Darker and more grayish than summer pelage. Tending to be more brownish than corresponding pelage of *S. o. longicauda.* Upperparts most nearly between chaetura drab and fuscous black; underparts and tail essentially as in summer.

Skull.—Broad, flat and rather massive for the species *obscurus.* Slightly more flattened than that of *S. o. longicauda,* less depressed interorbitally, the braincase flatter and arising somewhat less abruptly in the frontal region, superior portion of rostrum broader and more flattened, lachrymal foramen smaller, unicuspidate teeth narrower, dental pigmentation less extensive. Larger, broader interorbitally, with broader, longer rostrum, and more deeply pigmented and heavier dentition than in *S. o. elassodon.* Larger than that of *S. o. alascensis,* more flattened, averaging broader interorbitally, with relatively longer palate and heavier dentition.

Measurements.—Type (adult female): Total length, 120; tail vertebrae 56; hind foot, 15. *Skull:* Type (adult female; teeth slightly worn): Condylobasal length, 18.4; palatal length, 7.3; breadth of cranium, 8.8; interorbital breadth, 3.8; maxillary breadth, 5.3; maxillary tooth row (anterior edge of second upper incisor to posterior edge of last upper molar measured at alveolar border), 6.6.

Remarks.—Nine specimens of *Sorex obscurus malitiosus* are in the series from the type locality. These are fairly constant in their characteristics and represent an island form which is probably confined to Warren Island. In the flatness of its skull *malitiosus* shows its nearest tendency toward *S. o. elassodon,* but on the whole the form is more like *S. o. longicauda* than any other subspecies. Its geographic range, however, is separated from that of *longicauda* by the range of *S. o. elassodon* which seems to occur on most of the islands between Admiralty Island, Alaska, and Moresby Island, British Columbia.

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PROCEEDINGS

OF THE

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FIVE NEW SPECIES OF JASSOIDEA FROM HONDURAS (HEMIPTERA: HOMOPTERA).

BY EDMUND H. GIBSON.

The specimens from which the following descriptions have been made were collected by Mr. F. J. Dyer at Tegucigalpa, Honduras, during June of 1918. Two other species of Jassoidea in the same collection I have identified as *Tettigonia prolixa* Fowler, and *Tettigonia fuscolineella* Fowler.

Tettigonia dyeri, n. sp.

Vertex but slightly shorter than length of pronotum at the middle. Median line of vertex barely discernable. Head finely punctured. Pronotum broadly rounding anteriorly and deeply sinuate posteriorly. Pronotum deeply pitted along anterior border. Scutellum acute. Elytra reticulate beyond clavus. Female segment longer at middle than at sides and deeply sinuate either side of middle. Male plates long and pointed.

Color.—Head dark reddish brown to nearly black. Light ring around ocelli. Two light spots at apex of vertex and a light spot above the antennae. Pronotum lighter than head, ground color yellow. Anterior pits brownish, with black bordering posterior margin. Scutellum yellow with six dark spots, apex white. Elytra dark, reddish brown to black with prominent yellow veins. Costal margin light. Light beneath. Legs yellow.

Length, ♀ 4.5–5 mm., ♂ 4 mm.

Type ♀, allotype ♂, paratypes 19 ♀ and 39 ♂, all collected by F. J. Dyer at Tegucigalpa, Honduras, June, 1918. In the collection of the U. S. National Museum.

Named in honor of the collector.

Type No. 23,114.

Draeculacephala soluta, n. sp.

Length of vertex about equals width between the eyes and the length of the pronotum. Vertex deeply furrowed at apex, yellow with median line brown or black branching two-thirds its distance from base. Circular lines along lateral borders of vertex traceable also curved line between

ocellus and median line. Dark line from ocellus to margin and spot behind ocellus on posterior margin prominent. Numerous brown lines or dots near anterior margin of pronotum which is yellow with much green coloring towards posterior margin. Scutellum yellow. Elytra green with yellow veins, reticulate beyond clavus. Face dark, clypeus light, otherwise light beneath.

Male plates long with strong spines on lateral margins. Length of male 6 mm.

Type ♂, paratypes 3 ♂ all collected by F. J. Dyer at Tegucigalpa, Honduras, June, 1918. Specimens in the collection of the U. S. National Museum.

Type No. 22,115.

Deltocephalus spinosus, n. sp.

Vertex produced but obtuse and rounding, not as long as width between the eyes. Ground color of head, pronotum, and scutellum yellow. Vertex with eight light brown spots, and four black spots on margin of vertex. Six wide brown lines on pronotum. Scutellum with median line crossed and a brown spot either side. Elytra translucent, brownish with veins whitish. Spines on legs and male plates long, stout and very prominent. Last ventral abdominal segment of female slightly notched either side of the middle.

Length of female, 3 mm.; male, 2.5–3 mm.

Type ♀, allotype ♂, paratype 2♂, all collected by F. J. Dyer at Tegucigalpa, Honduras, June, 1918. Specimens in collection of U. S. National Museum.

Type No. 22,116.

Athysanus picatus, n. sp.

Vertex but little produced, anterior and posterior margins nearly parallel, length less than one-half the distance between the eyes. Vertex light yellow and as viewed from above has a small black spot at apex with a larger one either side. A distinct heavy and wide black band between the eyes. Pronotum yellowish with six more or less prominent longitudinal lines and two transverse narrower lines along posterior border. Scutellum large, yellow and marked with four longitudinal lines. Elytra transparent with prominent black veins. Dark beneath. Legs dark, posterior margin of last ventral abdominal segment of female nearly truncate. Length of segment only slightly longer at sides than at middle.

Length of female, 5 mm.; width, 1.5 mm.

Type ♀, paratype ♂, both collected by F. J. Dyer at Tegucigalpa, Honduras, June, 1918. Specimens in the collection of the U. S. National Museum.

Type No. 22,117.

Athysanus miniaturatus, n. sp.

In general pattern the same as the preceding species, but much smaller in size, darker and shining. Face entirely black. The spots along margin

of vertex appear as a band when viewed from above. The yellow coloration of the preceding species appears whitish or cream with this. Veins of elytra are heavier and appear darker. The posterior margin of the last ventral segment of the female is distinctly sinuate at the middle.

Type ♀, allotype ♂, paratypes 11 ♂, all collected at Tegucigalpa, Honduras, by F. J. Dyer. Specimens in the collection of the U. S. National Museum.

Type No. 22,118.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

DESCRIPTION OF A NEW CONURUS FROM THE ANDAMAN ISLANDS.

BY HARRY C. OBERHOLSER.

Examples of *Conurus*[1] *fasciatus* from the Andaman Islands prove, on examination, to be subspecifically different from mainland birds. As they seem to have no available name, we propose for them

Conurus fasciatus abbotti, subsp. nov.[2]

Chars. subsp.—Similar to *Conurus fasciatus fasciatus* from Tenasserim, India, but much larger; upper and lower parts paler.

Description.—Type, adult male, No. 178,825, U. S. Nat. Mus.; South Andaman Island, Andaman Islands, Bay of Bengal, January 17, 1901; Dr. W. L. Abbott. Anterior edge of forehead narrowly black, connecting with a somewhat broader line extending across the upper part of the lores from the bill to the eyes; forehead behind this black line greenish glaucous, passing posteriorly into pale dull glaucous blue and laterally into turtle green; remainder of pileum olive buff with a wash of lavender gray; cervix and anterior portion of the sides of the neck, night green; upper back and posterior portion of the sides of the neck, rather dark absinthe green; lower back and scapulars, Scheele's green, verging a little toward calliste green, and passing into calliste green on the upper tail-coverts, and, like all the rest of the upper parts, excepting the pileum and cervix, with more or less evident shimmering vermiculations like those of moiré silk; middle pair of tail-feathers methyl green, edged broadly with Scheele's green on their basal portion, where this color occupies nearly all of the feathers, decreasing in width distally and disappearing about one-third of the distance from the end; remaining rectrices dull Scheele's green, narrowly methyl green along a part of the shaft, all the shafts dark brown; wings dark fuscous, the inner webs of the quills paler, the primaries narrowly edged on their inner webs, and the secondaries more widely margined on the same webs with colonial buff; exposed upper

[1]For the use of *Conurus* in place of *Palaeornis*, *cf.* Oberholser, Smithson. Misc. Coll., LX, No. 7, October 26, 1912, p. 4; Mathews, Novit. Zool., XVIII, 1911, p. 11.

[2]Named for the well-known naturalist, Dr. W. L. Abbott.

surface of wing-quills between Scheele's green and grass green, their outer edges narrowly yellowish; primary coverts grass green, their outer margins a little lighter; a large yellowish patch on the wing formed by all but the outermost median and greater coverts, by some of the posterior lesser coverts, and by the outer webs of the secondaries and of the tertials, this patch shading inwardly to aniline yellow, outwardly to javel green; remainder of the upper wing-coverts like the scapulars, the bend of wing more glaucous; lores and periophthalmic region, turtle green; upper part of cheeks dull burn blue; auriculars dull lavender; lower portion of the cheeks and the malar stripe together forming a broad black band extending backward to meet the corner of the night green cervical collar; chin dull cream buff; a narrow, fairly well-defined lavender collar extending back of the black moustachial band from its upper posterior point down across the throat; remainder of throat and breast between coral pink and onion-skin pink, the anterior and posterior edges of this area washed with lavender; abdomen, flanks, sides, and thighs, calliste green, strongly overlaid on abdomen with calamine blue; lower tail-coverts light yellow green; under surface of tail between dark olive buff and citrine drab, the edges of the feathers yellowish; lining of the wing lumiere green, varied with darker green, bluish, buffy, and a few dark fuscous spots formed by the centers of some of the feathers; "feet olive green; claws black."

Measurements.—Male:[1] wing, 169.5–174.5 (average, 172.3) mm.; tail, 196–198 (197); exposed culmen with cere, 27.5–28 (27.8); tarsus, 16–17.5 (17.0); middle toe without claw, 20–21 (20.7).

Female:[2] wing, 163–174 (average, 167.8) mm.; tail, 172–193 (180.8); exposed culmen with cere, 25–27.5 (26.1); tarsus, 15.5–18 (16.6); middle toe without claw, 20.5–23.5 (21.9).

Geographic distribution.—Andaman Islands, Bay of Bengal.

Remarks.—This new race from the Andaman Islands differs from *Conurus fasciatus major*[3] Richmond, from Pulo Babi, western Sumatra, in its much smaller size and usually lighter upper and lower parts; from *Conurus fasciatus perioncus* Oberholser,[4] from the Island of Nias, western Sumatra, in its inferior size, darker pileum, paler remaining upper surface, and lighter, more bluish posterior lower parts; and from *Conurus fasciatus calus*[5] Oberholser, from the Island of Simalur, western Sumatra, in its paler upper and lower parts, and somewhat less bluish posterior lower surface. Notwithstanding the wide separation of its range, *Conurus fasciatus abbotti* most closely resembles *Conurus fasciatus major* from islands off the western coast of Sumatra, and it seems thus to present another instance of parallel development of characters.

As in all forms of the species, individual variation covers a wide range of color, particularly on the throat and breast, for in some individuals

[1]Three specimens, from the Andaman Islands.

[2]Eight specimens, from the Andaman Islands.

[3]*Palaeornis major* Richmond, Proc. Biol. Soc. Washington, XV, August 6, 1902, p. 188 (Pulo Babi, western coast of Sumatra).

[4]Smithson. Misc. Coll., LX, No. 7, October 26, 1912, p. 4.

[5]Smithson. Misc. Coll., LX, No. 7, October 26, 1912, p. 4.

this area is much paler and more pinkish, from which it varies to a much darker and more lavender bluish shade. Colors of the soft parts, in addition to those already mentioned, are, as obtained from the labels of specimens, as follows: maxilla of male, red, its tip yellow or black; mandible, black; iris with its inner circle green, its outer ring yellow; bill of female wholly black, the cere brownish, and iris pale yellow.

The geographic distribution of this species shows a remarkable interruption, for the bird seems to be absent from the southern Malay Peninsula and from Sumatra, although it occurs in Tenasserim and on the Barussan Islands off the western coast of Sumatra. Including the form here described there seem to be now recognizable the following five subspecies of *Conurus fasciatus:*

Conurus fasciatus fasciatus (Müller).—Kumaon, the Himalaya Mountains and southern China, south to Cochin China and Tenasserim.

Conurus fasciatus abbotti Oberholser.—Andaman Islands.

Conurus fasciatus major (Richmond).—Pulo Babi and Pulo Lasia, Barussan Islands, western Sumatra.

Conurus fasciatus perioncus Oberholser.—Nias Island, Barussan Islands, western Sumatra.

Conurus fasciatus calus Oberholser.—Simalur Island, Barussan Islands, western Sumatra.

An idea of the considerable difference in size between the present new race and typical *Conurus fasciatus* may be obtained from a comparison of the wing measurements of five adult male specimens of the latter from Tenasserim. These are: 147, 150, 151, 153, 157 (average, 151.6). Detailed measurements of *Conurus fasciatus abbotti* are added below:

MEASUREMENTS OF SPECIMENS OF *Conurus fasciatus abbotti*.

U. S. Nat. Mus. number.	Sex	Locality.	Date.	Collector.	Total length.[1]	Wing.	Tail.	Exposed culmen.	Tarsus.	Middle toe without claw.
178825	♂	South Andaman I.[2], Andaman Islands	Jan. 17, 1901	Dr. W. L. Abbott	381.5	174.5	196	27.5	16	21
178827	♂	"	"	"	399.5	173	198	28	17.5	20
178828	♂	"	"	"	387.5	169.5	197	28	17.5	21
Average of 3 males					.....	172.3	197	27.8	17.0	20.7
178826	♀	South Andaman I., Andaman Islands	Jan. 15, 1901	Dr. W. L. Abbott	368.5	174	177	27.5	17	23.5
178823	♀	"	Jan. 17, 1901	"	343	166	.....	26	16	22
178506	♀	"	"	"	.....	166	.....	25	18	22
178824	♀	"	"	"	356	166	172	25	15.5	21
178505	♀	"	"	"	343	166	.....	27	16.5	20.5
178504	♀	Macpherson Strait, Andaman Islands	Jan. 15, 1901	"	318	163	.....	25	16	21
178829	♀	"	"	"	368.5	170	193	27	16.5	23
178503	♀	Henry Lawrence I., Andaman Islands	Jan. 10, 1901	"	362.5	171	181	26.5	17	22
Average of 8 females					.....	167.8	180.8	26.1	16.6	21.9

[1] Measured in the flesh by the collector.
[2] Type.

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PROCEEDINGS

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LAKE SUPERIOR LUMBRICULIDS, INCLUDING VERRILL'S LUMBRICUS LACUSTRIS.

BY FRANK SMITH.

The oligochaete material of the United States National Museum includes two bottles of specimens from Lake Superior obtained in 1871 by S. I. Smith, naturalist of the United States Lake Survey. One bottle contains eight specimens catalogued as cotypes of *Lumbricus lacustris* Verrill (U. S. N. M. Cat. No. 15,589). They were collected among Cladophora in 8–13 fathoms of water, on the south side of Saint Ignace Island. Aside from fragments of tubificids they include parts of specimens of two distinct species of lumbriculids. The label of the other bottle indicates that its contents were from a different collection, but gives no locality other than Lake Superior. The contents are similar to those of the first bottle and include specimens of the same two lumbriculid species and of at least two distinct tubificid genera. Since *L. lacustris* is recorded only from the locality mentioned above and from the stomachs of whitefish taken at Outer Island (Smith, S. I., 1874:697), it seems somewhat probable that the two lots of specimens are from the same locality. One of the lumbriculid species is *Lumbriculus inconstans* (F. Smith) which is already known from a considerable number of localities in the region of the Great Lakes and of the upper Mississippi Valley, and has recently been found in the Arctic regions of North America. The other is a form previously unknown and closely related to *Mesoporodrilus asymmetricus* F. Smith (1896:402).

Verrill's description of *Lumbricus lacustris* (Smith and Verrill, 1871:449) is apparently based on a combination of characters of the two lumbriculid species above mentioned and is as

follows: *Lumbricus lacustris* Verrill, sp. nov. About 1.5 inches long, 0.04 in diameter. Body round, distinctly annulated. Head short, conical, obtusely pointed. Setae spine-like, strongly curved, acute, arranged two by two, those of each pair close together. Color reddish brown.

Of these characters some apply equally well to both species. "Body round, distinctly annulated"; "setae * * * arranged two by two, those of each pair close together"; are of this class. The applicability of statements concerning the length and color can not be judged, because of the poor state of preservation of the material. The diameter (0.04 inch) is correct for the specimens of Mesoporodrilus, but that dimension in the Lumbriculus specimens is scarcely three-fourths as great. The description of the setae (spine-like, strongly curved, acute), is more nearly correct for the Mesoporodrilus specimens, since the setae of the others are cleft at the outer extremity. The description of the prostomium probably more accurately fits the specimens of Lumbriculus, although applicable to the others in their poorly preserved condition.

It seems reasonable to assume that the description really combines characters of the two species, but it more nearly fits the specimens of Mesoporodrilus. *Lumbriculus inconstans* has had frequent mention in literature for something over twenty years. Under the circumstances the writer prefers to associate Verrill's species name with the specimens of the other genus which will accordingly be described as *Mesoporodrilus lacustris* (Verrill) F. Smith.

This paper is No. 128 of the series of contributions from the Zoological Laboratory of the University of Illinois.

Mesoporodrilus F. Smith.

Setae closely paired; simple. Clitellum on 10–12 and part or all of 9 and 13; complete ventrad. Spermiducal pore on 10; median. Oviducal pores paired; in 11/12; in line of ventral setae. Spermathecal pores median; anterior to spermiducal pore. Spermaries and spermiducal funnels paired; in 10, or in 9 and 10. Atrium elongated; differentiated into a muscular sperm reservoir and relatively small penial organ, connected by a contorted duct. Ovaries and oviducal funnels paired in 11. Spermathecae, one or two; asymmetrical in position; opening on 9 or on 8 and 9.

Type species, *Mesoporodrilus asymmetricus* F. Smith.

Mesoporodrilus asymmetricus F. Smith.

Length, 30 mm. Diameter, 0.5 mm. Somites, 65. Pale; without pigment. Prostomium prolonged into tentacle-like extension. Setae closely paired; simple. Clitellum, ½9–½13. Spermathecal pores median; two on 9. Spermaries and spermiducal funnels paired; in 10. Diameter of reservoir one and one-half times that of its lumen. Spermathecae, two; in same side of 9; sacs may extend into adjacent somite.

Holotype.—Cat. No. 27,235, Illinois State Laboratory of Natural History. Type locality, Quiver Lake, near Havana, Illinois.

Mesoporodrilus lacustris (Verrill) F. Smith.

Length, 42 mm. (?) Diameter about 1 mm. Somites, number unknown. Setae closely paired; simple. Clitellum on 9–12 and encroaching on 13. Spermathecal pores median; on 9, or on 8 and 9 Spermaries and spermiducal funnels paired; in 9 and 10. Sperm ducts, two pairs; all opening into the single sperm reservoir near its posterior end. Diameter of reservoir three times that of its lumen. Spermathecae, one, or two; asymmetrically disposed; each with elongated duct opening on 9, or on 8 and 9; and sac with thick wall, in the same or in adjacent somites.

Cotypes.—Cat. No. 15,589, U. S. N. M.; Cat. No. 17,947, U. S. N. M. (Lectotype, Cat. No. 15,589, U. S. N. M , selected by F. Smith). Type locality: Lake Superior, south side of Saint Ignace Island.

The specimens show evidence of maceration and are more or less fragmentary. There are no complete specimens permitting observation of length and number of somites. The specimen which serves as type for this description is one of the cotypes mentioned above; it includes fifteen anterior somites, and is cut into transverse sections. Transverse and sagittal sections were made from specimens from the other collection which are used as paratypes.

External Characters.

The maximum diameter (1 mm. or slightly more) is in the clitellar somites and considerably exceeds that of the accompanying Lumbriculus specimens. The color of the living worms is unknown, since the "reddish brown" of Verrill's description may or may not apply to this species. The prostomium has very thin walls near the end; is incomplete in each specimen studied; and in living specimens may terminate in a tentacle-like extension, as does that of *M. asymmetricus*. The setae are slender and very similar in form to those of the last named species (Smith, 1896, fig. 9). The nodule is one-third of the length, from the distal end, and the outer third is more strongly curved. Ventral setae of the clitellar somites are about 0.225 mm. long and the diameter near the nodule is about 0.011 mm. Other setae are somewhat smaller. The relative distances between the pairs are approximately indicated by the formula: $aa = {}^{7}_{10}bc = {}^{7}_{10}dd$. The clitellum is chiefly confined to somites 9–12, but encroaches slightly on 13. The spermiducal pore is on the summit of a small median papilla near the posterior border of 10. The oviducal pores are

in 11/12 and about in line with the ventral seta bundles. The spermathecal pores are median and borne near the posterior border of their somites on small papillae. In one specimen there are two, one each on 8 and 9; and in each of the others there is a single one which is on 9.

Internal Characters.

A satisfactory account of the internal organs is difficult and in some respects impossible, because of the poor state of preservation of the material. The alimentary tract is quite similar to that of *M. asymmetricus*, since it lacks a gizzard and is otherwise rather simple in type. The contents are such as might be expected in specimens living among algae. Diatom shells are especially abundant. A pair of transverse blood vessels connect the dorsal and ventral vessels in the posterior part of each of most of the anterior eleven somites. The relations of the vessels posterior to these somites can not be determined. The first nephridia seem to be in the eleventh or twelfth somites.

Fortunately the reproductive organs are better preserved than are most others and permit a description of most of the important characters. In the specimens sectioned, there are uniformly a pair of spermaries and a pair of spermiducal funnels in each of somites 9 and 10. The funnels of the anterior pair project freely into the posterior part of the somite, and the ducts extend along the septum to the ventral wall and along the latter to the atrium. Each of the funnels of the posterior pair is included in the anterior part of a corresponding sperm sac. The course of each duct from the funnel is first anteriad, out of the sperm sac, and then ventrad along the septum to the body wall. The courses of the two ducts differ from this point, since each of them extends to the atrium which is on one side of the alimentary tract. The duct from the funnel which is on the same side as the atrium follows a rather direct course to the posterior part of the atrium, the "sperm reservoir," while the course of the duct from the other funnel is between the nerve cord and body wall to the atrial side of the worm and then posteriorly to the reservoir. The sperm ducts of the two pairs in their courses along the reservoir are at first separated slightly from its wall, but gradually approach it and are in contact with it in the posterior half, and finally penetrate the muscular wall and open into the lumen of the reservoir near its end. In one specimen the courses of the ducts along the reservoir are approximately 90° apart, while in another, two of the ducts are closely approximated.

The single atrium is on the left side in some specimens and on the right side in the type and in others. It is somewhat similar to that described and figured in *M. asymmetricus*. The term atrium is here used to include all three parts of the single asymmetrical ectal part of the spermiducal apparatus, since it is apparently homologous with one of the paired atria of Rhynchelmis. In the description of *M. asymmetricus* the term atrium was used in a different way and applied to a small chamber near the spermiducal pore (Smith, 1896, fig. 7, at). No such chamber is developed in *M. lacustris*. The atrium terminates in a penial organ corresponding

to the "prostate" of *M. asymmetricus*, but relatively shorter and more slender. This organ extends dorsad and laterad to a position near the opening of a sperm sac in septum 10/11, where it is connected with the anterior end of the sperm reservoir by a duct of diameter similar to that of the penial organ (0.045–0.05 mm.). The reservoir is included within the sperm sac of the atrial side of the worm and extends posteriad two to four somites, the distance varying in different specimens. In the type specimen it ends in somite 14. The wall of the reservoir includes a thin lining epithelium; several thin laminae of muscular tissue of which the fibers have a spiral direction, some to the right and some to the left; and a very thin outer layer of longitudinal fibers. The spirally arranged fibers are more nearly transverse than longitudinal, and the angles which they make with each other and with those of the superficially placed longitudinal series are approximately equal (60° or 120°). This arrangement is very different from that in *M. asymmetricus* in which the chief mass of muscle fibers have a slightly spiral course, but are nearly parallel with the longitudinal axis of the sperm reservoir. The diameter of the reservoir is approximately one-fifth of that of the somites containing it and the diameter of the lumen, midway of its length, is about one-third of that of the reservoir. Connected with the wall by narrowed extensions are numerous gland cells of large size which are similar to the "large prostate cells" of *Eclipidrilus frigidus* described by Eisen (1895). There is no large mass of gland cells related to the spermiducal pore, as in *M. asymmetricus* (Smith, 1896:405). Paired sperm sacs extend posteriad from septum 10/11 through four to six somites; in the type specimen at least to somite 16.

There are uniformly a pair of ovaries in 11 attached to septum 10/11, and a pair of oviducal funnels and oviducts in the same somite, related to septum 11/12. From 11/12 a pair of ovisacs extend posteriad a few somites beyond the posterior ends of the sperm sacs, which are included in the anterior part of the ovisacs. More commonly there is one spermatheca in 9, opening on the mid-ventral surface near the posterior boundary of the somite, but in one specimen there is also a second spermatheca in 8, with opening similarly placed in that somite. The spermathecal ducts have relatively small diameter and are sharply distinct from the large, rather thick-walled sacs. The sacs often invade adjacent somites and may be on either the right or left side of the alimentary tract. The diameter of the duct is about 0.075 mm., while that of the sac is often more than half of the diameter of the worm, and hence nearly ten times as great.

Relationships of Mesoporodrilus lacustris.

The relationships of *M. lacustris* seem very clear. In having a single atrium opening on the mid-ventral surface, and asymmetrically arranged spermathecae which also have median pores, its close relation to *M. asymmetricus* is obvious. While agreeing with this species in various other characters of generic rank, it is clearly distinguished by several characters of specific grade. Two pairs of spermaries and spermiducal

funnels instead of a single pair of each is an important difference. *M. lacustris* more frequently has a single spermatheca, and when two are present they are in different somites; while each of the two known specimens of *M. asymmetricus* has two spermathecae in one somite. The musculature of the sperm reservoir is quite different in the two species, that of *M. lacustris* being unique, while that of *M. asymmetricus* is more like that in allied genera. The relative diameters of the reservoir and its lumen are quite different in the two species. In *M. lacustris* the diameter of the lumen is but one-third of that of the reservoir, midway of its length; while in *M. asymmetricus* the diameter of the lumen is about two-thirds of that of the reservoir.

The assumption of Michaelsen (1908:163) that *M. asymmetricus* is a "reduction form" (meaning that it has been derived from an ancestral form with two pairs of male gonads and of sperm ducts) receives increased support, now that we know a closely related form with two pairs of spermaries and of sperm ducts.

The genus Mesoporodrilus was established for the species *M. asymmetricus* which alone among lumbriculids had median spermiducal and spermathecal pores, together with asymmetry of the related organs. Later, another genus, Premnodrilus F. Smith (1900), was established for a single North American species, *P. palustris*. In several characters, notably the spermiducal organs, these two genera are closely allied to the older genus Eclipidrilus Eisen and Michaelsen (1901:149) has seen fit to unite the three species in the last named genus. The discovery of a second species of Mesoporodrilus and also of a second distinct species of Premnodrilus, soon to be described, has led the writer to revive these generic names. Notwithstanding their close relationship to each other and to Eclipidrilus, each of these two genera has at least two perfectly distinct species which are much more closely allied to each other than they are to the species of the other genus. Furthermore, these two genera have been separated long enough to permit the development of a "reduction form" in each. As the oligochaete fauna of other parts of the country becomes better known, it seems highly probable that still other species may be found belonging to one or the other. Whether the two groups are at present given generic or subgeneric rank is a matter of no great consequence.

Lumbriculus inconstans (F. Smith).

The collections contain more specimens of this species than of *M. lacustris*, but the latter would be more likely to be selected for study because of their greater size. Scarcely any of the specimens were sexually mature. But two were noticed that are at a stage showing spermathecae and these illustrate the extreme variability among specimens of Lumbriculus. Neither of them has precisely the same number and arrangement of the various reproductive organs that is known in any other specimen of the genus. One specimen, from those labelled as cotypes of *Lumbricus lacustris*, has paired atria in 10; spermaries and spermiducal funnels paired in 9 and 10; ovaries and oviducal funnels paired in 11, 12 and 13; and

spermathecae paired in 12–15. This is the first record in the species of three pairs of oviducal funnels, and this number was recorded but once by Mrázek (1907:420) among 163 specimens of *Lumbriculus variegatus*. The other specimen having spermathecae is from the other bottle and has paired atria in 10; paired spermaries and spermiducal funnels in 9 and 10; paired ovaries and oviducal funnels in 11 and 12; and paired spermathecae in 11–13.

The sperm ducts could be traced throughout most of their course in each of the two mature specimens. As noted by Mrázek (1907:434) in *L. variegatus*, the ducts are very slender, have a tortuous course, and are followed with difficulty. There is almost certainly a general correspondence in their course and in their relation to the atria, with the conditions found in Trichodrilus. The course of the ducts of either side is: (a) along the anterior surfaces of their septa, ventrad to the body wall; (b) along the latter, with more or less tortuous windings, to the atrium; and then (c) along its surface to the summit, where the lumen of each duct becomes continuous with that of the atrium. Each duct from 9 extends dorsad on the anterior side of the corresponding atrium and that from 10 on the posterior side.

The writer has recently received from Dr. Paul S. Welch, specimens of *L. inconstans* which were collected in Douglas Lake, near Cheboygan, Michigan, in July, 1918. One of these which is sexually mature has been sectioned and it also exhibits the Trichodrilus relation of spermiducal organs.

In a discussion of the position of Lumbriculus in the family Lumbriculidae, Michaelsen (1908:165–166) has mentioned the need for information about the relations of sperm ducts and atria in *L. inconstans*. He also suggested the possible desirability of uniting Trichodrilus with Lumbriculus. He considered the various characters which separate the two genera, as relatively unimportant. While admitting that any one of the characters might by itself be insufficient to warrant generic separation of the two groups of species, the writer considers that much more importance should be attached to the existence of a considerable number of such differences than to the presence of but one or two. An additional difference, not mentioned by Michaelsen, is in the position of the spermathecal pores. In *L. variegatus* and *L. inconstans* the pores are dorsad of the ventral seta bundles and in or near the lateral line; while in Trichodrilus, they are posteriad of the ventral seta bundles and in line with them, as in most lumbriculids.

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PROCEEDINGS

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NEW PACIFIC COAST PLANTS.

CHARLES V. PIPER.

The following species of plants are described partly from recently collected specimens and partly from material that has accumulated in the National Herbarium. Most of them belong to highly critical genera. The most noteworthy perhaps is the new Cryptantha, the second American species with perennial woody stems.

Sidalcea nelsoniana, n. sp.

Perennial 60–90 cm. high, the stems up to the inflorescence glabrous or bearing a few more or less retrorse mostly simple short hairs; leaf-blades orbicular in outline, glabrous above, sparsely hirsutulous beneath, 5–10 cm. broad, the lower ones 7-lobed, the lobes incisely dentate with 3–5 obtuse teeth, the upper leaves increasingly deeply cleft, the uppermost divided to the base into linear entire or more or less toothed segments; lower petioles 2–4 times as long as the blade, glabrous to sparsely hirsute; stipules lanceolate, acute; racemes dense, erect, panicled; bracts linear; pedicels shorter than the calyx, densely stellate-puberulent; calyx sparsely and minutely stellate-puberulent, at length loosely reticulate-veined, the broadly triangular acute lobes little longer than the tube; petals rose-colored, emarginate at apex, about 1 cm. long; stamineal column retrorsely pubescent; carpels nearly smooth, not reticulate, minutely and sparsely puberulent.

Allied to *S. campestris Greene* and *S. oregana* (*Nutt.*) *Gray*. From the former it is easily separated by the smaller rose-colored corollas, the shorter almost glabrous calyx-lobes, and the nearly smooth carpels; and from the latter by the simple pubescence, shorter calyx-lobes, and smaller flowers. The species is apparently restricted to the Willamette Valley of Oregon, where it was collected by *Thos. Howell* in June, 1880, and recently by *Prof. J. C. Nelson* as follows: Salem, No. 2233, July 17, 1918 (type), and No. 650, June 5, 1916; Eugene, No. 332, July 14, 1915; Independence, No. 2270, June 22, 1918.

Cryptantha suffruticosa, n. sp.

Perennial, the stout stem woody, much branched above the base, the branches erect, about 30 cm. high; stems setose, or above partly strigose; leaves numerous, sessile, narrowly lanceolate, acute, pustulate-setose above, setose and strigose beneath, 2–4 cm. long; racemes rather dense, simple, erect, a few of the flowers bracteate, 5–10 cm. long; pedicels mostly shorter than the calyx; calyx deciduous with the pedicel when ripe, the lobes lanceolate, acute, erect, glabrous above, densely setose beneath with both coarse and fine hairs, 3 mm. long; corolla tubular-campanulate, 2 mm. long; nutlets ovate-triangular in outline, obtuse, 1.5 mm. long, pale brown, narrowly wing-margined, the back armed with about 40 evenly-scattered pale papillae, the ventral side dull, glabrous, the groove open its entire length and gradually widening toward the base.

Camp Muchacho in the southwestern part of the Colorado Desert, San Diego County, Calif., *C. R. Orcutt*, No. 2070, Sept. 20, 1890. Type in the U. S. National Herbarium, sheet No. 201,311.

Closely allied to *C. racemosa* (*Wats.*) *Greene* but readily distinguished by the larger leaves, coarser pubescence, simple racemes, shorter pedicels, larger calyx and larger broader-margined nutlets.

Stachys caurina, n. sp.

Perennial, 60–100 cm. high, 4-angled, glabrous, except the angles, which are sparsely armed with short retrorse pustulate bristles; leaves thin, oblong-ovate, acute, rounded or truncate at base, dentate scarcely crenate, sparsely appressed pubescent on both sides, 10 cm. long, 4–5 cm. wide; petioles loosely hirsute, half as long as the blades; inflorescence loose, the flowers in verticils of four; lower bract leaflike, sessile, dentate, the upper much reduced and subentire; calyx broadly funnel-form, loosely villous, 10 mm. long, the teeth subequal, half as long as the tube, narrowly triangular and twice as long as broad, sharply acute, each tipped with a long spine one-fourth to one-third as long as the lobes; corolla purple, nearly glabrous, 25 mm. long, the lower lip considerably longer than the upper.

Olympic Mts., Clallam County, Wash., July, 1900, *A. D. E. Elmer*, No. 2543. Type sheet No. 401,868 in U. S. National Herbarium. The long narrow teeth of the calyx readily separate this species from *S. ciliata Dougl.*

Stachys confertiflora, n. sp.

Perennial, 60–90 cm. high; stems erect, 4-angled and thickly retrorse prickly on the angles, otherwise glabrous; petioles retrorsely pubescent, less than half as long as the blades, mostly more than half as long as the internodes; blades oblong-ovate, cordate or subcordate, rather obtuse, coarsely crenate-dentate, sparsely hirsute on both surfaces especially on the veins, more so beneath, 8–12 cm. long, half as wide; spike dense 4–5 cm. long, of 7–9 close whorls of flowers, densely viscid-puberulent throughout, not at all hirsute; bracts ovate, small, half as long as the calyx; calyx

densely viscid-puberulent, striately many-nerved, 7–8 mm. long, the short broadly triangular subequal slightly spreading teeth each tipped with a short spine; corolla purple, viscid-puberulent, 15–18 mm. long, the narrow cylindraceous tube twice as long as the lower lip, the lips wide spreading, the lower somewhat longer; filaments sparsely pubescent.

Corvallis, Oregon, along a stream, August 7, 1918, *C. V. Piper.* Closely allied to *S. ciliata Douglas* and *S. pubens (Gray) Heller* but easily distinguished by the dense inflorescence and the viscid-puberulent calyx. The character given for the genus in the Synoptical Flora of "filaments naked" requires revision, as they are pubescent in all the species here mentioned.

Stachys ciliata macrantha, n. subsp.

Leaves lance-ovate, rounded or subcordate at base, dentate not at all crenate, rather densely and loosely appressed pubescent on each side, the blades 6–10 cm. long about twice as long as the petioles; calyx 10–12 mm. long, tubular, more or less enlarged in the throat, loosely and thinly pubescent, the oblong-ovate acute teeth each armed with a short spine at tip; corolla 3–4 cm. long, puberulent.

Chilliwack Valley, B. C., June 29, 1901, *J. M. Macoun* No. 54,685. Type sheet in U. S. National Herbarium, No. 444,143.

Penstemon deserticola, n. sp.

Perennial from loosely branched woody rootstocks; whole plant perfect glabrous except only the leaf margins; stems erect or nearly so, 15–20 cm. high; leaves 6 or 7 pairs, entire, sessile, narrowly oblanceolate, the lower obtuse, the upper acute, thick, pale and somewhat glaucous, glabrous except the finely puberulent margins, 2–4 cm. long; inflorescence narrow, 6–10 cm. long; bracts lance-linear, acute, gradually reduced; peduncles short, equalling the calyx; calyx-lobes oblong-ovate, acuminate, broadly and somewhat erosely scarious-margined, 5–6 mm. long; corolla (probably blue) broadly tubular-funnelform, 2 cm. long, entirely glabrous, the broad lobes rounded; sterile filament glabrous; anthers glabrous, split from the tips to but not through the connective.

Near Desert Well between Button Springs and Silver Lake, Lake County. Ore., alt. 1400 m., July 5, 1894, *J. B. Leiberg* No. 402. Type in U. S. National Herbarium, sheet No. 404,811. Nearest *P. speciosus Dougl.*, from which it differs by the smaller corolla, differently shaped leaves, and much smaller size.

Cirsium oreganum, n. sp.

Weakly armed; stems erect, slender, loosely arachnoid, 60 cm. high, branched from the base, the branches erect; leaves narrowly oblong, the lowermost lobed, the others subentire, or with a few tooth-like lobes, the tip and the lobes or teeth spine-tipped, prickly-ciliate, green and glabrous above, thinly white tomentose beneath, the lowermost petiolate, the

cauline sessile by a broadened clasping base, 8–10 cm. long; heads all long-peduncled, hemispheric, 2.5 cm. high; involucre campanulate, 2 cm. high, thinly white arachnoid; tegules subequal, lanceolate-subulate, erect, loosely imbricated in 3 or 4 series, green, not at all glandular, somewhat spinulose-ciliate, the outer ones each with a slender straight spiny tip, the inner each with a flattened scarious lacerated tip; corollas purple-red, 2 cm. long, the lobes as long as the sparsely pilose throat; anthers glabrous; akenes sparsely puberulent; pappus sordid, most of the bristles clavellate tipped.

Nearest *C. remotifolius* (Hook.) D.C., but very distinct from that.

Grant's Pass, Oregon, *M. E. Peck*, No. 4839, June 30, 1913.

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PROCEEDINGS

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GENERAL NOTES.

THE GENERIC NAMES ANOA AND BUBALUS.

In the sixth installment of his important paper "On Some External Characters of Ruminant Artiodactyla,"[1] Mr. R. I. Pocock decides that *Anoa*[2] can not be maintained as a valid genus apart from *Bubalus*;[3] and inasmuch as the former name has page priority, he concludes that all the species of the Indian water-buffalo group, including *bubalis*, *mindorensis*, *depressicornis*, and their allies, must be placed together in a genus called *Anoa*. Both of these arguments are open to further consideration. The International Code does not provide for page priority except in a recommendation to revisers that it serve as a guide in making selections between available names of even date. Since Lydekker, in 1913,[4] with all the known facts before him, has deliberately chosen *Bubalus* over *Anoa* for a group combining all the forms under discussion, *Anoa* can not now replace *Bubalus* unless it can be shown that some other author has forestalled Lydekker's action by an earlier selection. I have been unable to find any previous writer, who has dealt with this group, with a sufficiently modern knowledge of the nomenclature involved to entitle him to figure as a "first reviser"; and apparently Lydekker's selection of *Bubalus* must stand for those who wish to combine the two genera. There is, however, a considerable reason why *Anoa* and *Bubalus* should not be combined. The ten skulls of *Anoa*, representing two distinct species, that I have examined since I published my paper on the buffaloes in these Proceedings in 1911[5] all agree in the possession of only two lower premolars, which seems to be the normal number for these dwarfish Celebesian buffaloes. It seems quite out of the question, considering this very unusual bovine dental formula, to do away with *Anoa* as a valid genus.

—*N. Hollister.*

[1] Ann. and Mag. Nat. Hist., ser. 9, vol. 2, pp. 456–459. December, 1918.
[2] H. Smith, Griffith's Cuvier's Anim. Kingd., vol. 5, p. 355. 1827.
[3] Idem, p. 371.
[4] Cat. Ungulate Mamm. Brit. Mus., vol. 1, p. 40. 1913.
[5] Proc. Biol. Soc. Washington, vol. 24, pp. 191–194. June 23, 1911.

A NEW NAME FOR THE WILD SHEEP OF NORTHEASTERN CHINA.

The wild sheep of the mountains north of Peking was described and figured by Peters in 1876 under the name *Ovis jubata*. This name is preoccupied by *Ovis aries jubata* Kerr, 1792 (Anim. Kingd., p. 330) and *Ovis jubata* Fitzinger, 1860 (Wiss.-pop. Naturg. der Säugeth., vol. 5, p. 243). Lydekker, 1913 (Cat. Ungulate Mamm., vol. 1, p. 96) erroneously adopted the name *Ovis argali mongolica* Severtzow, 1873 (Trans. Soc. Nat. Moscou, vol. 8, art. 2, p. 154) for this mountain sheep, but this name is preoccupied by the *Ovis steatopyga mongolica* of Fitzinger, 1860 (Wiss.-pop. Naturg. der Säugeth., vol. 5, p. 31), and the question of its applicability need not here be considered. Other names placed with a query by Lydekker in the synonymy of "*mongolica*" (*Ovis argali dauricus* Severtzow and *Ovis darwini* Przewalski) are not available for the very distinct sheep described by Peters. The *Ovis jubata* of Peters (Mon.-ber. K. Preuss. Akad. Wiss., 1876, p. 177, pls. 1–4), being without a valid name, may be called *Ovis* **comosa.** —*N. Hollister.*

THE FAMILY NAME OF THE AMERICAN WOOD WARBLERS.

Under either of the rules that have been advocated for the determination of family names in zoology, the present designation of the Mniotiltidae must be changed. For a number of years up to 1838 the birds of this group were referred to the Paridae or to the Sylviidae without even subfamily distinction; but in 1838 Bonaparte (Geog. and Comp. List Birds Europe and North America, p. 20) instituted for them the subfamily Sylvicolinae, based on the genus *Sylvicola* Swainson. Some years later this subfamily was raised to family rank, and thereafter until 1877 it continued to be known as Sylvicolidae. Since, meanwhile, the generic name *Sylvicola* had passed out of use because preoccupied, Mr. Robert Ridgway, in 1877, changed the family name to Mniotiltidae (U. S. Geol. Explor. 40th Par., IV, No. 3, 1877, p. 427), based on the genus *Mniotilta* Vieillot. If, however, the oldest genus in the family be used as the type genus, this distinction will fall to *Icteria* Vieillot (1807), and the family name will become Icteriidae, which is confusingly near the family name Icteridae, now in use for the American Orioles or Hangnests. A better rule, at least in this case, would be to use as a type genus the generic group first made the basis of the family name. In the family of wood warblers this is the genus now known as *Compsothlypis* Cabanis, which, when called by the preoccupied name *Sylvicola* Swainson (Philos. Mag., new series, I, June, 1827, p. 433, type designated by Swainson [Zool. Journ., III, 1827, p. 169] as *Sylvia pusilla* Wilson = *Compsothlypis americana pusilla* [Wilson]), was the type genus of the family Sylvicolidae. Our wood warblers, now called Mniotiltidae, should, therefore, become Compsothlypidae. —*Harry C. Oberholser.*

EUMYIAS VERSUS STOPORALA.

The generic name *Eumyias* Cabanis has been used by a number of recent authors instead of *Stoparola* Blyth, apparently because the latter was preoccupied by a previous use of the same name for another group. Dr. C. W. Richmond some time ago called attention (Proc. U. S. Nat. Mus., XXXV, December 16, 1908, p. 643) to the use of *Stoparola* by Blyth for *Muscicapa atricapilla* Linnaeus (*Stoparola* Blyth, in White, Nat. Hist. Selborne, 1836, p. 119, note); hence, of course, *Stoparola* as thus spelled is unavailable for further use for the genus of East Indian flycatchers to which it commonly applies; and, were there no other prior name, the generic term *Eumyias* Cabanis (Mus. Hein., I, 1850, p. 63) would come into use for the group. This name *Stoparola*, as first used in 1836 by Blyth, is not invalid, as Mr. Stresemann at one time contended (Ornith. Monatsber., 1913, p. 25; but *cf.* also Novit. Zool., XXI, No. 1, Feb. 25, 1914), since its basis is "*Stoparola luctuosa*, the Pied Flycatcher, Auct." the technical specific term of which is a well-known synonym of *Muscicapa atricapilla* Linnaeus.

In 1845, however, Blyth employed *Stoporala*, thus spelled (Journ. Asiatic Soc. Bengal, XVI, 1845, p. 125), in such a way that its type became, by virtual monotypy, *Muscicapa melanops* Vigors. Since by the current rules of nomenclature *Stoporala* is not invalidated by *Stoparola*, the former should henceforth be the generic designation of the group of flycatchers congeneric with *Muscicapa melanops* Vigors, and hitherto called *Stoparola*.

—*Harry C. Oberholser.*

PASSERHERBULUS LECONTEII (AUDUBON) BECOMES PASSERHERBULUS CAUDACUTUS (LATHAM).

A number of years ago (The Auk, XIV, No. 3, July, 1897, p. 320), Mr. Ridgway identified the *Fringilla caudacuta* of Latham (Index Ornith., I, 1790, p. 459), described from the interior of Georgia, as an earlier name for the bird then called *Ammodramus leconteii* (now *Passerherbulus leconteii*). Since, however, this was preoccupied by *Oriolus caudacutus* Gmelin (Syst. Nat., I, pt. 1, 1788, p. 394), then called *Ammodramus caudacutus* (Gmelin) (now *Ammospiza caudacuta*), so long as the two were in the same genus, Mr. Ridgway very properly relegated it to synonymy. When the present writer removed *Passerherbulus caudacutus* (Gmelin) to the genus *Ammospiza* (Ohio Journ. Science, XVII, No. 8, June 2, 1917, pp. 333–334), he overlooked this note of Mr. Ridgway's. Now, however, since *Fringilla caudacuta* Latham and *Oriolus caudacutus* Gmelin are not homonyms, do not apply to birds in the same generic group, and are the earliest names of their respective species, both are available. Mr. Ridgway's identification of *Fringilla caudacuta* Latham is without doubt correct, and, since this is the case, there is apparently no reason for its rejection. This necessitates an unfortunate change by which *Passerherbulus leconteii* must be known by a generic and specific combination, *Passerherbulus caudacutus*, which has been applied in recent years to another closely allied species.

—*Harry C. Oberholser.*

THE PROPER ORTHOGRAPHY OF THE GENERIC NAME *PHOETHORNIS* SWAINSON.

The generic name of the well-known group of hummingbirds known as *Phoethornis* Swainson (Zool. Journ., III, November, 1827, p. 357; type, *Trochilus superciliosus* Linnaeus), is so often spelled as above written that it seems worth while to call attention to the fact that the earliest and therefore proper orthography of the name is *Phaethornis*, since Swainson wrote it thus (*Phaethornis* Swainson, Philos. Mag., new ser., I, No. VI, June, 1827, p. 441; type by original designation and monotypy, *Trochilus superciliosus* Linnaeus) in an incidental introduction of the name when treating a species of another genus in his now famous paper in the Philosophical Magazine, which antedated by a few months his intendedly prior article in the Zoological Journal. —*Harry C. Oberholser.*

THE STATUS OF THE SUBFAMILY NAME *FULIGULINAE.*

The subfamily name Fuligulinae has been continued in use, notwithstanding the fact that the generic name *Fuligula* Stephens (1824), from which it is derived, has been supplanted by *Marila* Oken (1817). A family or subfamily name, however, based on a generic name that has fallen into synonymy must, of course, be replaced; hence, while we continue, even if inadvisedly, to employ the name *Marila* instead of *Fuligula* for the Scaup Ducks and their allies, we must replace the subfamily name Fuligulinae by Marilinae. —*Harry C. Oberholser.*

ADDITIONS AND CORRECTIONS TO "A LIST OF FAMILIES AND SUBFAMILIES OF ICHNEUMONFLIES OR THE SUPER FAMILY ICHNEUMONOIDEA (HYMENOPTERA)."[1]

Since the above work was published, Dr. Harry C. Oberholser has called my attention to three subfamily names that are untenable according to the oldest genus method of forming family and subfamily names. I take this opportunity to correct some typographical and other errors in the same work.

Page 69—next to last line change Aphastobraconini to Aphrastobraconini.

Page 70—should read (Dacnusinae cresson) = Coeliniinae, new subfamily (Coelinius Nees, etc.), should read Paxylomma Brebisson instead of Paxylomma Prebisson; (Euphorinae Cresson) = Perilitinae, new subfamily (Perilitus Nees, etc.).

Page 71—for subfamify Pambolinae read subfamily Pambolinae, for Evenia read Evania, for Asphidius read Aphidius.

Page 72—for subfamjly Nesomesochorinae read subfamily Nesomesochorinae, under subfamily Hymenopharsalinae, include (Hymenopharsalia Morley).

Page 73—should read (Ctenopelminae, new subfamily) = Eucerinae new subfamily (Euceros Gravenhorst, etc.), change Accoenites to Acoenites.

Page 74—change Ambytelinae to Amblytelinae.

—*Henry L. Viereck.*

[1]Proc. Biol. Soc. Washington, 31 (69–74), 1918.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

A LIST OF THE FISHES OF PENNSYLVANIA.

BY HENRY W. FOWLER.[1]

The present paper is a summary of the data accumulated during the past twenty years, presented in condensed form, so that the distribution of each species may be traced so far as present details permit. For this reason they are arranged according to the various hydrographic basins with only the counties mentioned, additional records, where noteworthy, being supplied in parentheses. The work is therefore intended as a slight contribution to the distribution of our local fishes.

Like many departments of natural history the founding of the binomial system by Carl von Linné in 1758 first establishes several fishes from Philadelphia. Alexander Wilson contributes the first notice of shad and alewife in the article on ichthyology in Ree's Encyclopaedia, to which he secured an assistant editorship in 1806. His article was published about 1812. Charles Alexandre Le Sueur is the first to carefully study the fishes of this State, much of his material doubtless having been secured near Philadelphia. He is credited with sixteen of our species, while eight other names he proposes are synonyms. Constantine Samuel Rafinesque described many of our species in his Ichtlyologia Ohiensis. The localities given are seldom definite and usually would apply to the entire Ohio basin. He has described twenty-three of our species, besides fourteen synonyms.

Several of our species are also described by Achille Valenciennes, in colaboration with Baron Cuvier, in the great Histoire Naturelle des Poissons. Samuel Stehman Haldeman studied the fauna of the lower Susquehanna, though his contributions to ichthyology are rather incidental. He was signally unfortunate

[1]Published by permission of the Academy of Natural Sciences of Philadelphia.

in that the four species he described were all anticipated. Charles Girard was a frequent contributor to North American ichthyology, and though he described two species from our limits both are synonyms. Spencer Fullerton Baird published a few notes on Pennsylvania fishes and the only one he described added another synonym to our well known fall-fish.

The serious study of Pennsylvania fishes, however, begins with Edward Drinker Cope in his elaborate memoir the "Synopsis of the Cyprinidae of Pennsylvania."[1] Later he attempted "The Fishes of Pennsylvania,"[2] intended as a partly popular descriptive catalogue, apparently modeled from Jordan's Manual of Vertebrates. This work, likely valuable at the time of its publication, is chiefly useful for the notes on habits, etc. Cope described fourteen valid species and five synonyms. In this connection mention should be made of Jacob Stauffer, of Lancaster, who discovered two interesting fishes in his region, which were described by Cope. Stauffer's only contribution appears as his list of the fishes of Lancaster County.[3] This work is often faulty in the obscurity of determinations of many species. For instance, our common white catfish is described no less than three times. Tarleton Hoffman Bean gives a descriptive account[4] somewhat like Cope's. It is similarly marred by the inclusion of a number of species native to regions adjacent to Pennsylvania, but never actually taken in the State limits.

Among living writers Evermann and Bollman[5] publish an important account of Monongahela River fishes in 1885.[6] In 1902 Ross gives an account of twenty-five Center County fishes,[7] largely of an economic nature. His *Minytrema melanops*, *Leuciscus margarita* and *Hybopsis dissimilis* are important additions, and listed without comment or details of satisfactory comparison they may be dropped.

Below follows a list of my own papers:

[1] Tr. Amer. Philos. Soc., XIII, 1869, pp. 35–399, Pl. 10–13.

[2] Rep. State. Comm. Fisher., 1879–80 (1881), pp. 59–145, figs. 1–44.

[3] In Mombert's Hist. Lancaster County, Pa. 1868.

[4] The Fishes of Pennsylvania. Rep. State Comm. Fisher., 1889–91 (1892), pp. 1–149, Pls. 1–35.

[5] Bollman died of fever contracted in Georgia swamps, 1889.

[6] Ann. N. Y. Acad. Sci., III, 1883–5 (1886), pp. 335–340.

[7] Studies of Fishes of Central Pennsylvania. Rep. State Comm. Fisher., 1902, pp. 111–124.

1905. Exoglossum in the Delaware. < Science, XXI, June 30, 1905, p. 994.
1906. Notes on Pennsylvania Fishes. < Amer. Nat., XL, 1906, pp. 595–6.
—— Pimephales in the Susquehanna. < L. c., p. 743.
—— Fishes in Winter. < Forest and Stream, LXIX, December 28, 1906, p. 1022.
1907. Records of Pennsylvania Fishes. < Amer. Nat., XLI, January, 1907, pp. 5–21, fig. 1.
1908. Fishes of Bristol. < Bucks County Gazette, December 25, 1908. (Popular newspaper account, with list.)
1909. A Synopsis of the Cyprinidæ of Pennsylvania. < Proc. Acad. Nat. Sci. Phila., 1908 (Feb. 2, 1909), pp. 517–553, Pl. 27.
1910. Note on some Pennsylvania Fishes. < Science, XXXI, March 4, 1910, pp. 345–6. (List of some Indiana County species.)
—— Note on the distribution of some Pennsylvania Fishes. < L. c., XXXII, December 23, 1910, pp. 926–7. (Few species from Altoona and Easton.)
1912. Records of Fishes for the Middle Atlantic States and Virginia. < Proc. Acad. Nat. Sci. Phila., 1912, pp. 34–59, 2 figs. (Pennsylvania, pp. 41–50.)
—— Some Features of Ornamentation in Fresh-water Fishes. < Amer. Nat., XLVI, 1912, pp. 470–6, figs. 1–21. (On spawning cyprinoids and catostomoids.)
—— Hermaphrodite Shad in the Delaware. < Science, XXXVI, July 5, 1912, pp. 18–19.
1914. Some Local Fish-eating Birds. < Cassinia, 1913 (March, 1914), pp. 6–16.
—— Fishes in Polluted Waters. < Copeia, April 15, 1914, No. 5. (List of species in the Schuylkill tidal.)
—— Fishes of the Poquessing Creek. < Aquarium Notes and News, I, No. 4, April, 1914, pp. 35–6.
—— Description of a new Blenny from New Jersey, with notes on other fishes from the Middle Atlantic States. < Proc. Acad. Nat. Sci. Phila., 1914 (June 24), pp. 342–358, 1 fig. (Pennsylvania, pp. 346–353.)
—— Hadropterus peltatus in the Delaware. < Science, XL, December 25, 1914, pp. 939–940.
1915. An Annotated List of the Cold-blooded Vertebrates of Delaware County, Pennsylvania. < Proc. Del. Co. Inst. Science, VII, No. 2, June, 1915, pp. 1–13. (Fishes, pp. 1–8.)
—— Fishes of the Neshaminy Creek Tidal Region. < Aquar. Notes and News, II, No. 6, June, 1915, pp. 49–51.
1916. The River Fishes of Upper Philadelphia. < L. c., III, No. 4, April 1916, pp. 28–30.
—— The Fishes of Pennypack Creek in Upper Philadelphia. < L. c., III, No. 8, October 1916, pp. 60–64.
1917. Fishes found in Bucks County, Pennsylvania, during 1915 and 1916. < L. c., IV, No. 2, February, 1917, pp. 11–15.

—— Notes on the Spawning-habits of our Lampreys. < L. c., IV, No. 4, April, 1917, pp. 28–32.
—— Notes on Fishes from New Jersey, Pennsylvania and Maryland. < Proc. Acad. Nat. Sci. Phila., 1917 (April 24), pp. 108–126. (Pennsylvania, pp. 115–122.)
—— Fish Life of Mill Creek, a Delaware tributary. < Bristol Daily Courier, X, April 23, 1917. (Popular newspaper article.)
—— Spawning Habits of Local Fishes, No. 1. < Aquar. Notes and News, IV, No. 5, May, 1917, pp. 37–40, 1 fig.
—— Spawning Habits of Local Fishes. No. 2. < L. c., IV, No. 7, September, 1917, pp. 52–56.
1918. Fishes from the Middle Atlantic States and Virginia. < Occas. Papers Mus. Zool. Univ. Michigan, No. 56, May 6, 1918, pp. 1–19, Pls. 1–2. (Pennsylvania, pp. 8–14.)
—— The Fishes of Perry County, Pennsylvania. < Copeia, November 21, 1918, No. 63, pp. 89–91.

PETROMYZONIDÆ.

Petromyzon marinus Linnæus. Lamprey.

In the Delaware basin (Douglasville) Berks, (Neshaminy Falls and George School) Bucks, (Stock Grange, French Creek?) Chester, Northampton, Philadelphia, Pike and Wayne Counties.

Susquehanna basin (Athens and Sayre) Bradford, (Emporium) Cameron, (Harrisburg) Dauphin, (Marietta, McCall's Ferry, Peach Bottom, Pequea, Safe Harbor) Lancaster, (Newton Hamilton) Mifflin, (Marysville) Perry and (Peach Bottom, York Furnace) York Counties.

Ichthyomyzon concolor (Kirtland). Silvery Lamprey.

(Conemaugh River formerly and Two Lick Creek) Indiana and McKean Counties. Lake Erie?

Entosphenus æpypterus (Abbott). Brook Lamprey.

Delaware basin in (Red Clay Creek near Kennett Square and White Clay Creek near Leonard) Chester County.

Elk basin, (Elk View?) Chester County.

Susquehanna basin in Cameron County.

Ohio basin (Pittsburg) Allegheny, Indiana and (Seven Bridges) Potter Counties.

ACIPENSERIDÆ.

Acipenser sturio Linnæus. Sturgeon.

Delaware basin in Bucks, Delaware, Northampton and Philadelphia Counties, now rare Susquehanna basin (reported at Coxtown in 1844[1]) Dauphin and (Fite's Eddy, Marietta, McCall's Ferry, Peach Bottom and Safe Harbor) Lancaster Counties.

Acipenser fulvescens Rafinesque. Lake Sturgeon.

Ohio basin (Pittsburgh formerly) Allegheny, (Foxburg and mouth of

[1]Forest and Stream, XXXIV, March 20, 1890, p. 171.

Clarion River) Clarion, (Conemaugh and Kiskiminitas Rivers formerly) Indiana and (Tedionte and Warren) Warren Counties.

Erie basin, (Massassauga Point) Erie County.

Acipenser brevirostrum Le Sueur. Short-nosed Sturgeon.

Delaware basin in Bucks and Philadelphia Counties. Le Sueur's type[1] is still in the Academy and agrees with several examples I examined in the field.

Scaphirhynchus platorynchus (Rafinesque). Shovel-nosed Sturgeon.

Though the late Dr. Bean mentions[2] that "in the large tributaries of the Ohio, in western Pennsylvania, the species is very common," the original account by Rafinesque[3] contains our only definite record.

POLYODONTIDÆ.

Polyodon spathula (Walbaum). Paddle Fish.

Ohio basin in Allegheny, (Foxburg and Clarion River formerly) Clarion, (Conemaugh River formerly at Blairsville) Indiana, McKean and (Tedionte and Warren) Warren Counties.

LEPISOSTEIDÆ.

Lepisosteus osseus (Linnæus). Long-nosed Gar-pike.

Delaware basin in Bucks, (Chester) Delaware, Monroe and Philadelphia Counties.

Susquehanna basin (Marietta, Safe Harbor) Lancaster and (Peach Bottom) York Counties.

Ohio basin (Foxburg) Clarion, (Conneaut Lake) Crawford, (Conemaugh River formerly) Indiana and Warren Counties.

Erie basin in Erie County.

Lepisosteus platostomus (Rafinesque). Short-nosed Gar-pike.

Known from Rafinesque's original account[4] which says "as far as Pittsburgh in the Allegheny River." Reported to me at Erie.

AMIATIDÆ.

Amiatus calvus (Linnæus). Bowfin.

A "dog fish" reported at Allegheny City[5] is the only record I have for the Ohio basin, though I found it abundant at Erie. Stauffer mentions an example from the Susquehanna at Safe Harbor,[6] likely an introduction?

HIODONTIDÆ.

Hiodon alveoides (Rafinesque). Gold-eye.

Known from Cope's Beaver and Youghiogheny River examples which I reported.[7]

[1] Proc. Acad. Nat. Sci. Phila., 1910, p. 604, Pl. 38, fig. 1.

[2] Rep. Com. Fisher. Pa., 1889-91 (1892), p. 5.

[3] Ich. Ohien., 1820, p. 80. Seldom reaching as high as Pittsburgh in the Ohio River.

[4] Ich. Ohien., 1820, p. 72.

[5] Forest and Stream, VIII, May 24, 1877, p. 243.

[6] Amer. Nat., XIII, 1879, p. 525.

[7] Proc. Acad. Nat. Sci. Phila., 1911, p. 204.

Hiodon tergisus Le Sueur. Moon-eye.

Originally described from the Ohio at Pittsburgh,[1] though no recent records given. I found it at Erie.

DOROSOMIDÆ.

Dorosoma cepedianum (Le Sueur). Mud-shad.

Only recorded from the tidal of the Delaware basin, (Andalusia) Bucks, Chester, Delaware and (Bridesburg, Tacony) Philadelphia Counties. Le Sueur originally[2] obtained it in the "market of Philadelphia."

CLUPEIDÆ.

Pomolobus chrysochloris Rafinesque. Inland Alewife.

Known from Rafinesque's original account,[3] which gives it from the Ohio River and also says "it seldom goes as far as Pittsburgh." "Herring" reported formerly in (the Conemaugh River) Indiana County were likely this species.

Pomolobus mediocris (Mitchill). Fall Herring.

I have no local material though include this species provisionally, or only on reports of its occurrence in the Delaware River tidal of Bucks County at Tullytown. In late October, 1906, a school of about fifty large examples were reported at this point. When swimming at the surface they produced quite a disturbance, somewhat like a school of menhaden. About eight were taken on hooks baited with our common river killifishes (*Fundulus*), which were fastened to the hook by the upper jaw. When opened the herring were found more or less gorged with killifish. They took the bait with a rush and greatly interested the local anglers who called them "jacks" or "skipjacks." They remained until November. A large herring taken at the same place in December, 1912, was doubtless the same species.

Pomolobus pseudoharengus (Wilson). Alewife.

Delaware basin, (New Hope) Bucks, Delaware and Philadelphia Counties. Susquehanna basin, (Harrisburg) Dauphin, (reported at Clarke's Ferry dam in North Branch[4]) Lackawanna, (Bainbridge, Fite's Eddy, Marietta, McCall's Ferry, Pequea, Safe Harbor) Lancaster, (Marysville) Perry and (McCall's Ferry, Peach Bottom and York Furnace) York Counties.

Pomolobus æstivalis (Mitchill). Summer Herring.

Only found in the Delaware basin in Bucks, Delaware and Philadelphia Counties.

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[1] As *Hiodon tergisus* Le Sueur, Journ. Acad. Nat. Sci. Phila., I, pt. 2, 1818, p. 366, and *H. clodalus* Le Sueur, l. c., p. 367. Rafinesque next names it *Hyodon vernalis* in Ich. Ohien., 1820, p. 43.

[2] As *Megalops cepediana* in l. c., p. 361.

[3] Rafinesque, l. c., p. 38.

[4] Forest and Stream, LXVII, November 3, 1906, p. 701.

Alosa sapidissima (Wilson). Shad.

Delaware basin (Andalusia, Biles Creek, Dunk's Ferry, New Hope, Scott's Creek, Uhlertown, Yardley) Bucks, (Long Ford, Ming and mouth of French Creeks, Perkiomen, Phœnixville all formerly) Chester, Delaware, (Delaware Water Gap) Monroe, (Easton formerly) Northampton, (Manayunk, Port Providence, Valley Forge all formerly) Montgomery, Philadelphia, (Bushkill, Conashaugh, Delaware, Egypt Mills, Matamoras, Milford, Shohola) Pike and (Damascus, Hancock, Millanville) Wayne Counties.

Susquehanna basin (Browntown, Sayre, Towanda) Bradford, (Beach Haven, Berwick, Bloomfield) Columbia, (Harrisburg) Dauphin, (Bainbridge, Columbia, Creswell, Fite's Eddy, Marietta, Peach Bottom, Pequea, Safe Harbor, Washington Borough) Lancaster, (Hemlock Creek, Nanticoke, Pittston, Shickhinny, Wilkes Barre all formerly) Luzerne, (Long Level, Northumberland) Northumberland, (Duncannon, Newport) Perry, (Keelersburg, Meshoppen, Tunckhannock) Wyoming and (East Prospect, Long Level, York Furnace) York Counties.

Brevoortia tyrannus (Latrobe). Menhaden.

Valenciennes early mentions it as abundant in the markets of New York and Philadelphia, and later Cope says it ascends the Delaware for a short distance in our limits. I have it from the New Jersey shore at Washington Park in August, 1908, and since then small examples have been found in Bucks (far as Dunk's Ferry) and Philadelphia Counties.

SALMONIDÆ.

Coregonus clupeaformis (Mitchill). Whitefish.

Abundant at Erie.

Leucichthys sisco (Jordan). Sisco.

Known from Erie examples reported by Jordan and Evermann.[1]

Leucichthys artedi (Le Sueur). Lake Erie Herring.

Abundant at Erie.

Cristivomer namaycush (Walbaum). Lake Trout.

Erie County. Introduced in the Delaware and Susquehanna basins.

Salvelinus fontinalis (Mitchilll). Brook Trout.

Delaware basin in Berks, Bucks, Carbon, Chester, Lackawanna, Lebanon, Lehigh, Montgomery, Monroe, Northampton, Philadelphia, Pike, Schuylkill and Wayne Counties.

Susquehanna basin in Berks, Blair, Bradford, Cameron, Center, Clearfield, Clinton, Columbia, Cumberland, Dauphin, Elk, Fulton, Huntingdon, Juniata, Lackawanna, Lancaster, Lebanon, Luzerne, Lycoming, Mifflin, Perry, Potter, Schuylkill, Somerset, Sullivan, Susquehanna, Wayne, Wyoming and York Counties.

[1]Bull. Bur. Fisher., XXIX, 1909, p. 12, fig. 6 (type) and Pl. 2, as *L. sisco huronius.*

Potomac basin in Adams, Franklin, Fulton and Somerset Counties.

Genesee basin in Potter County.

Ohio basin in Erie, Fayette, Forrest, Indiana, McKean, Lawrence, Potter, Somerset, Warren and Westmoreland Counties.

Erie basin in Erie County.

ARGENTINIIDÆ.

Osmerus mordax (Mitchill). Smelt.

Delaware tidal in Bucks, Delaware and Philadelphia Counties. Besides the types of *O. sergenti* Norris[1] many examples in the markets examined, but the latter largely imported.

ICTALURIDÆ.

Ictalurus furcatus (Valenciennes). Chuckle-head Cat.

Reported from the Monongahela River by Evermann and Bollman.[2]

Ictalurus punctatus (Rafinesque). Spotted Cat.

Ohio basin in Allegheny, Beaver, Clarion, (Blairsville formerly) Indiana and Westmoreland Counties.

Erie basin in Erie County. Possibly the alleged *A. nigricans* (Le Sueur) is not distinct from the present species. The late Dr. Bean says "Erie receives its supply of catfish from fishermen who operate in the lake from Erie to Elk Creek, with set-lines during the summer months." A number of catfish in the markets and fisheries at Erie were examined and all of the fork-tailed forms were the spotted cat. All had the predorsal bony bridge complete and but few were without spots.

Ameiurus catus (Linnæus). White Cat.

Delaware basin in Bucks, (Brandywine Creek) Chester, Delaware and (League Island) Philadelphia Counties.

Susquehanna basin in Lancaster and (Peach Bottom) York Counties.

Ameiurus natalis (Le Sueur). Yellow Cat.

Only met with by me at Erie. Not found east of the Alleghanies in our limits, though in the Ohio basin early recorded as far as Pittsburgh.[3]

Ameiurus nebulosus (Le Sueur). Common Cat.

Delaware basin in Berks, Bucks, Carbon, Chester, Delaware, Lebanon, Monroe, Montgomery, Northampton, Pike and Wayne Counties.

Susquehanna basin in Bedford, Berks, Blair, Bradford, Cambria, Center, Chester, Clearfield, Clinton, Cumberland, Fulton, Juniata, Lackawanna, Lancaster, Lebanon, Luzerne, Lycoming, Mifflin, Montour, Northumberland, Perry, Snyder, Somerset, Sullivan, Susquehanna, Tioga, Wayne, Wyoming and York Counties.

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[1] Proc. Acad. Nat. Sci. Phila., 1868, p. 93. Schuylkill below Fairmount dam. Brandywine Creek.

[2] Ann. N. Y. Acad. Sci., III, 1883–5 (1886), p. 336.

[3] *Pimelodus cupreus* Rafinesque, Ich. Ohien., 1820, p. 65.

Northeast River basin in Chester County.

Potomac basin in Franklin, Fulton and Somerset Counties.

Genesee basin in Potter County.

Ohio basin in Armstrong, Beaver, Cambria, Crawford, Indiana, Jefferson, Lawrence, McKean, Somerset, Venango, Warren and Westmoreland Counties.

Erie basin in Erie County.

Ameiurus melas (Rafinesque). Black Cat.

Abundant and frequently marketed at Erie.

Ameiurus nigrilabris (Cope). Blind Cat.

Only known from the types,[1] procured in the Conestoga Creek, tributary to the Susquehanna. Originally placed in a separate genus on account of the rudimentary eyes, though otherwise very close to *A. nebulosus.*

Leptops olivaris (Rafinesque). Mud Cat.

Known from Cope's material I reported from the Youghiogheny River.[2]

Noturus flavus Rafinesque. Stone Cat.

Reported from Pigeon Creek by Evermann and Bollman[3] and I have it from the Youghiogheny River and Indiana County.

Schilbeodes gyrinus (Mitchill). Tadpole Cat.

Many examples from the Delaware basin in Bucks. Lehigh and Philadelphia Counties, and the Genesee basin in Potter County.

Schilbeodes insignis (Richardson). Margined Cat.

Delaware basin in Bucks, (Jordan Creek near Helfrich's Spring) Lehigh, Montgomery, Monroe, Northampton, Philadelphia, Pike and Wayne Counties.

Elk basin in Chester County.

Susquehanna basin in Blair, Bradford, Cameron, Center, Cumberland, (Columbia, Fite's Eddy, Marietta) Lancaster, Sullivan and(Peach Bottom, Sowego Creek) York Counties.

Schilbeodes miurus (Jordan). Brindled Cat.

Recorded by McConnell[4] from Indiana County. I have been unable to examine the material on which this record is based.

CYPRINIDÆ.

Campostoma anomalum (Rafinesque). Stone Roller.

Susquehanna basin in Columbia County.

Ohio basin in Allegheny, Beaver, Indiana, Lawrence and McKean Counties.

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[1] *Gronias nigrilabris* Cope, Proc. Acad. Nat. Sci. Phila., XVI, 1864, p. 231.

[2] Amer. Nat., XLI, 1907, p. 14.

[3] Ann. N. Y. Acad. Sci., III, 1883–5 (1886), p. 335.

[4] Rep. Com. Fisher. Pa., 1905, p. 179.

Chrosomus erythrogaster (Rafinesque). Red-bellied Dace.

Only known from Cope's material obtained in the Kiskiminitas River, which I reported recently.[1]

Chrosomus erythrogaster eos (Cope). Eastern Red-bellied Dace.

Known only from Cope's types,[2] obtained in Meshoppen Creek, Susquehanna basin, in September, 1861, and of them but three now extant.

Hybognathus nuchalis Agassiz. Silvery Minnow.

Reported from the Ohio basin by Cope,[3] though I have no material.

Hybognathus nuchalis regius (Girard). Eastern Silvery Minnow.

Only in the Delaware tidal in Bucks, Delaware and Philadelphia Counties.

Hybognathus nuchalis argyritis (Girard). Blunt-jawed Silvery Minnow.

Known from Cope's material from the Kiskiminitas I recently noticed.[4]

Pimephales promelas Rafinesque. Black-headed Minnow.

I met with it in the Ohio basin of McKean County.

Pimephales notatus (Rafinesque). Blunt-nosed Minnow.

Delaware basin in Bucks, Lehigh and Montgomery Counties.

Susquehanna basin in Berks, Blair, Lebanon, Dauphin, Snyder and York Counties.

Ohio basin in Allegheny, Clarion, Indiana, McKean and Westmoreland Counties.

Semotilus bullaris (Rafinesque). Fall Fish.

Delaware basin in Berks, Bucks, Chester, Delaware, Lehigh, Monroe, Montgomery, Northampton, Philadelphia, Pike and Wayne Counties.

Susquehanna basin in Berks, Bradford, Cambria, Chester, Clinton, Cumberland, Huntingdon, Lancaster, Lycoming, Mifflin, Montour, Potter, Somerset, Wayne and York Counties.

Potomac basin in Franklin and Somerset Counties.

Semotilus atromaculatus (Mitchill). Creek Chub.

Delaware basin in Berks, Bucks, Chester, Delaware, Lehigh, Monroe, Montgomery, Northampton, Philadelphia, Pike and Wayne Counties.

North East basin in Chester County.

Potomac basin in Franklin and Somerset Counties.

Susquehanna basin in Berks, Blair, Cameron, Chester, Clinton, Columbia, Cumberland, Dauphin, Huntingdon, Lackawanna, Lancaster, Lebanon,

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[1] Proc. Acad. Nat. Sci. Phila., 1908 (1909), p. 519.
[2] *C. eos* Cope, Proc. Acad. Nat. Sci. Phila., 1861, p. 523.
[3] Rep. Com. Fisher. Pa., 1879–80 (1881), p. 91.
[4] Proc. Acad. Nat. Sci. Phila., 1908 (1909), p. 521.
[5] L. c., p. 522. Port Allegany.

Lycoming, Mifflin, Montour, Perry, Potter, Snyder, Somerset, Sullivan, Wayne and York Counties.

Genesee basin in Potter County.

Ohio basin in Allegheny, Armstrong, Cambria, Clarion, Fayette, Indiana, Jefferson, McKean, Potter, Somerset, Warren and Westmoreland Counties.

Leuciscus margarita (Cope). Pearl Dace.

One of Cope's six examples, originally obtained in the Conestoga near Lancaster,[1] remains in the Academy. Ross records this species from Center County,[2] though I have been unable to examine his material.

Leuciscus carletoni Kendall. Carleton's Dace.

A single example I obtained in high color July 23, 1899, in McKean County at Cole Grove, is interesting as a new addition to the fauna.[3] It was captured in a small mountain-stream, the surface of which was largely covered with petroleum, so that the fish was not discovered until taken out of the water in a net. Associated were a number of other small fishes as creek chubs, silver-fins and cut-lips. Though I wrongly identified the present example as the pearl dace, as indicated below, it agrees in every way with the present species.

Leuciscus vandoisulus Valenciennes. Rosy-sided Dace.

Delaware, Elk and North East basins in Chester County.

Susquehanna basin in Cameron, Chester and Lancaster Counties.

Leuciscus elongatus (Kirtland). Slender Dace.

Ohio basin in Crawford, Indiana and McKean Counties.

Abramis crysoleucas (Mitchill). Roach.

Delaware basin in Berks, Bucks, Chester, Delaware, Lebanon, Lehigh, Monroe, Montgomery, Northampton, Philadelphia and Pike Counties.

Susquehanna basin in Cameron, Lackawanna, Lancaster, Mifflin, Sullivan and York Counties.

Ohio basin in Clarion and Elk Counties.

Erie basin in Erie County.

Ceratichthys vigilax Baird and Girard. Cliola Minnow.

Recorded from the Monongahela by Evermann and Bollman.[4]

Notropis bifrenatus (Cope). Bridled Minnow.

Delaware basin in Berks, Bucks, Chester, Delaware, Lehigh, Montgomery, Northampton and Philadelphia Counties.

Susquehanna basin in York and Lancaster Counties.

1*Clinostomus margarita* Cope, Tr. Amer. Philos. Soc., (2) XIII, 1866, p. 377, fig. (teeth), Pl. 13, fig. 1.

2Rep. Com. Fisher. Pa., 1902, p. 114.

3*L. margarita* (non Cope) Fowler, Science, XXXI, March 4, 1910, p. 346.

4Ann. N. Y. Acad. Sci., III, 1883–5 (1886), p. 336.

Notropis deliciosus (Girard). Straw-colored Minnow.

Recorded from the Monongahela by Evermann and Bollman,[1] and I have it from Indiana County.

Notropis procne (Cope). Swallow Minnow.

Delaware basin in Berks, Bucks, Chester, Delaware, Montgomery and Philadelphia Counties.

Elk and North East basins in Chester County.

Susquehanna basin in Berks, Columbia, Dauphin, Lancaster, Lebanon, Snyder and York Counties.

Notropis boops Gilbert. Big-eyed Minnow.

I obtained it at Foxburg in Clarion County.[2]

Notropis keimi Fowler. Allegheny Minnow.

Only the types obtained in the Allegheny basin.[3]

Notropis hudsonius (Clinton). Spawn-eater.

Ohio basin in the Monongahela River and McKean County. Erie basin in Erie County.

Notropis hudsonius amarus (Girard). Eastern Spawn-eater.

Delaware basin in Bucks, Chester, Delaware, Lehigh, Montgomery, Philadelphia and Pike Counties.

Susquehanna basin in Center, Columbia, Dauphin, Lancaster, Lebanon, Snyder and York Counties.

Notropis whipplii (Girard). Silver-fin.

Ohio basin in the Kiskiminitas and Youghiogheny Rivers, and McKean County. Erie basin in Erie County.

Notropis whipplii analostanus (Girard). Eastern Silver-fin.

Delaware basin, Berks, Bucks, Carbon, Chester, Delaware, Lehigh, Montgomery, Philadelphia and Pike Counties.

Elk basin in Chester County.

Susquehanna basin in Berks, Blair, Columbia, Dauphin, Huntingdon, Lancaster, Lebanon, Mifflin, Perry, Snyder, Susquehanna, Wyoming and York Counties.

Notropis cornutus (Mitchill). Red-fin.

Delaware Basin in Berks, Carbon, Chester, Delaware, Lehigh, Monroe, Montgomery, Northampton, Philadelphia and Pike Counties.

Elk basin in Chester County.

Susquehanna basin in Bedford, Berks, Cameron, Chester, Columbia, Cumberland, Center, Dauphin, Lancaster, Lebanon, Luzerne, Lycoming, Perry, Sullivan, Snyder, Susquehanna, Wyoming and York Counties.

[1] L. c.

[2] Science, XXXI, March 4, 1910, p. 338.

[3] Proc. Acad. Nat. Sci. Phila., 1908 (1909), p. 533, Pl. 27.

Genesee basin in Potter County.
Ohio basin in Clarion, Indiana, Lawrence, McKean and Warren Counties.
Erie basin in Erie County.

Notropis chalybæus (Cope). Iron-colored Minnow.

Originally described from the Schuylkill near Conshohocken[1] and I obtained it in the Delaware basin in Bucks, Montgomery and Northampton Counties.

Notropis jejunus (Jordan). Hungry Minnow.

Reported from the Monongahela by Evermann and Bollman.[2]

Notropis atherinoides Rafinesque. Emerald Minnow.

The Monongahela by Evermann and Bollman, and I have it from the Beaver River, Indiana and Erie Counties.

Notropis photogenis (Cope). Arrow Minnow.

Two of the types from the Youghiogheny River[3] and an example from Indiana County examined.

Notropis photogenis amœnus (Abbott). Attractive Minnow.

Delaware basin in Bucks, Monroe, Montgomery and Philadelphia Counties.
Susquehanna basin in Center, Columbia, Dauphin, Lancaster, Lebanon, Perry, Snyder and York Counties.

Notropis dilectus rubrifrons (Cope). Red-faced Minnow.

The types[4] and Indiana County examples.

Ericymba buccata Cope. Scalloped Minnow.

The types[5] and Indiana County material examined. Both this and the preceding recorded from the Monongahela by Evermann and Bollman.

Rhinichthys cataractæ (Valenciennes). Long-nosed Dace.

Delaware basin in Bucks, Carbon, Chester, (Hosensack) Lehigh and Northampton Counties.
Susquehanna basin in Blair, Cameron, Center, Columbia, Cumberland, Dauphin, Lancaster, Lebanon, Luzerne, Perry and Snyder Counties.
Elk basin in Chester County.
Ohio basin in Fayette and Indiana Counties.

Rhinichthys atronasus (Mitchill). Black-nosed Dace.

Delaware basin in Bucks, Carbon, Chester, Delaware. Lehigh, Monroe, Montgomery, Northampton, Philadelphia and Pike Counties.
Elk and North East basins in Chester County.

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[1] *Hybopsis chalybæus* Cope, Trans. Amer. Philos. Soc., (2), XIII, 1869, p. 383.
[2] Ann. N. Y. Acad. Sci., III, 1883–5 (1886), p. 338.
[3] *Squaluis photogenis* Cope, Proc. Acad. Nat. Sci. Phila., 1864, p. 280.
[4] *Alburnus rubrifrons* Cope, l. c., 1865, p. 85.
[5] L. c., p. 88.

Susquehanna basin in Berks, Blair, Cameron, Columbia, Chester, Center, Cumberland, Dauphin, Huntingdon, Lackawanna, Lancaster, Lebanon, Luzerne, Mifflin, Perry, Potter, Snyder, Sullivan and York Counties.

Potomac basin in Fulton County.

Genesee basin in Potter County.

Ohio basin in Beaver, Fayette, Indiana, McKean, Potter, Somerset, Warren and Westmoreland Counties.

Rhinichthys bowersi Goldsborough and Clark,[1] from the Ohio basin of West Virginia appears only a local variety. A number of specimens from many of the above listed districts show even greater ranges of variation, with many details in extremes of other characters in combination. The fact of the lesser row of teeth, for instance, being absent or consisting only of a single tooth is a very variable condition.

Hybopsis dissimilis (Kirtland). Spotted Chub.

Cope's material from the Monongahela and Youghiogheny Rivers examined.

Hybopsis storerianus (Kirtland). Storer's Chub.

Evermann and Bollman report it from the Monongahela.[2]

Hybopsis kentuckiensis (Rafinesque). Horned Chub.

Elk basin in Chester County.

Susquehanna basin in Berks, Cameron, Center, Dauphin, Lancaster, Lebanon, Perry, Snyder, Susquehanna and York Counties.

Ohio basin in Beaver, Fayette, Indiana, Lawrence, McKean, Warren and Westmoreland Counties.

No definite record has been given for the Delaware, where it likely does not occur. Possibly *H. dissimilis* Ross is the present species.

Exoglossum maxillingua (Le Sueur). Cut-lips.

Delaware basin in Berks, Bucks, Chester, Delaware and Montgomery Counties.

Elk basin in Chester County.

Susquehanna basin in Berks, Blair, Cameron, Center, Columbia, Cumberland, Dauphin, Juniata, Lancaster, Lebanon, Luzerne, Snyder, Sullivan and York Counties.

Ohio basin in McKean County.

CATOSTOMIDÆ.

Cycleptus elongatus (Le Sueur). Black-horse.

Mentioned by Rafinesque in the Ohio as far as Pittsburgh,[3] and Cope reports it from the Allegheny. An example obtained by Cope from the Kiskiminitas River is doubtless partly the basis of his record and the only one from our limits I examined.

[1] Bull. Bur. Fisher., XXVII, 1907 (March 14, 1908), p. 36, fig.

[2] Ann. N. Y. Acad. Sci., III, 1883–5 (1886), p. 339.

[3] Ichth. Ohien., 1820, p. 60.

Amblodon bubalus Rafinesque. Small-mouth Buffalo.

Reported by Rafinesque, who says it comes as far as Pittsburgh.[1] No other records have been given, though doubtless it may have been found in the Allegheny, at least until recently.

Carpiodes carpio Rafinesque. Carp Sucker.

Known from two of Cope's examples I reported[2] from the Beaver River.

Carpiodes thompsoni Agassiz. Lake Carp Sucker.

Found at Erie by the writer 1912–1914.

Carpiodes cyprinus (Le Sueur). Eastern Carp Sucker.

Found at several localities in the Susquehanna basin in Lancaster and York Counties. Not certainly known from the Delaware in our limits.

Carpiodes difformis Cope. Snub-nose Carp Sucker.

A small example obtained by Cope in the Youghiogheny River reported by the writer.[3]

Carpiodes cutisanserinus Cope. Rough-nose Carp Sucker.

Only known from the type taken in the Kiskiminitas River.[4]

Carpiodes velifer (Rafinesque). Quill-back.

Besides Rafinesque's original record from the Ohio River to Pittsburgh.[5] Evermann and Bollman obtained it in the Monongahela and I have two examples obtained in the Youghiogheny by Cope.

Catostomus catostomus (Forster). Long-nose Sucker.

Jordan records it from the Youghiogheny River,[6] though this material I have not seen.

Catostomus commersonnii (Lacépède). Common Sucker.

Delaware basin in Berks, Bucks, Carbon, Chester, Delaware, Lehigh, Monroe, Montgomery, Northampton, Philadelphia, Pike and Wayne Counties.

North East basin in Chester County.

Susquehanna basin in Bedford, Berks, Blair, Bradford, Cameron, Center, Chester, Clinton, Columbia, Cumberland, Dauphin, Fulton, Juniata, Lackawanna, Lancaster, Lebanon, Luzerne, Lycoming, Mifflin, Perry, Snyder, Susquehanna, Wyoming and York Counties.

Potomac basin in Franklin and Fulton Counties.

Genesee basin in Potter County.

Ohio basin in Armstrong, Beaver, Cambria, Clarion, Fayette, Forest,

[1] L. c., p. 55.
[2] Proc. Acad. Nat. Sci. Phila., 1913, p. 46.
[3] Proc. Acad. Nat. Sci. Phila., 1913, p. 46.
[4] Proc. Amer. Philos. Soc., XI, 1870, p. 481.
[5] Ich. Ohien., 1820, p. 56.
[6] Bull. U. S. Nat. Mus., No. 12, 1878, p. 175.

Indiana, McKean, Somerset, Venango, Warren and Westmoreland Counties.

Erie basin in Erie County.

Catostomus nigricans Le Sueur. Black Sucker.

Delaware basin in Lehigh County, likely introduced?

Elk basin in Chester County.

Susquehanna basin in Berks, Blair, Cameron, Chester, Dauphin, Lancaster, Lebanon, Mifflin, Perry, Snyder and York Counties.

Ohio basin in Beaver, Clarion, Indiana, Lawrence, Warren and Westmoreland Counties.

Erimyzon sucetta oblongus (Mitchill). Chub Sucker.

Delaware basin in Berks, Bucks, Chester, Delaware, Lehigh, Montgomery, Northampton and Philadelphia Counties.

Susquehanna basin in Blair, Cameron, Center, Columbia, Cumberland, Dauphin, Lancaster, Mifflin, Sullivan and York Counties.

Erie basin in Erie County.

Moxostoma anisurum (Rafinesque). White-nose Red-horse.

The original account by Rafinesque[1] mentions it from the Ohio and large streams far as Pittsburgh. Cope later describes it from the Youghiogheny River,[2] and these types, together with Beaver River material, I have examined. McConnell has reported it from Jamestown in Mercer County.[3]

Moxostoma aureolum Le Sueur. Red-horse.

Ohio basin in Beaver, Indiana and Westmoreland Counties.

Erie basin in Erie County.

Moxostoma macrolepidotum (Le Sueur). Eastern Red-horse.

Delaware basin in Philadelphia County, where rare.

Susquehanna basin in Cumberland, Lancaster and York Counties.

Moxostoma breviceps (Cope). Long-tailed Red-horse.

The type from the Youghiogheny and Erie examples examined.

Moxostoma duquesnii (Le Sueur). Fine-scaled Red-horse.

Le Sueur originally had it from the Ohio at Pittsburgh.[4] Cope obtained an example in the Youghiogheny and one in the Beaver River in 1880. These and a small example from Indiana County constitute my material.

Placopharynx carinatus Cope. Big-toothed Sucker.

Günther records it from the Youghiogheny[5] and I have Cope's Beaver River material.

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[1] Ich. Ohien., 1820, p. 54.

[2] *Ptychostomus velatus* Cope, Proc. Amer. Philos. Soc., XI, 1870, p. 470.

[3] Rep. Com. Fisher. Pa., 1905 p. 178.

[4] *Catostomus duquesnii* Le Sueur, Journ. Acad. Nat. Sci. Phila., I, 1817, p. 105.

[5] As *C. duquesnii* (non Le Sueur) Günther, Cat. Fish. Brit. Mus., VII, 1868, p. 18.

ANGUILLIDÆ.

Anguilla rostrata (Le Sueur). Eel.

Delaware basin in Berks, Bucks, Carbon, Chester, Delaware, Lehigh, Monroe, Montgomery, Northampton, Philadelphia, Pike and Wayne Counties.

Susquehanna basin in Bedford, Berks, Blair, Bradford, Cameron, Clearfield, Clinton, Huntingdon, Lackawanna, Lancaster, Luzerne, Lycoming, Mifflin, Montour, Potter, Perry, Sullivan, Susquehanna, Wyoming and York Counties.

Potomac basin in Somerset County.

Ohio basin in Allegheny, Cambria, Clarion, Indiana, Potter, Somerset and Warren Counties.

Genesee basin in Potter County.

Erie basin in Erie County.

ESOCIDÆ.

Esox americanus (Gmelin). Banded Pickerel.

Delaware basin in Berks, Bucks, Carbon, Chester, Delaware, Lehigh, Monroe, Montgomery, Northampton, Philadelphia and Pike Counties.

Susquehanna basin in Berks, Blair, Chester, Columbia, Cumberland, Elk, Fulton, Huntingdon, Lancaster, Luzerne, Lycoming, Montour, Northumberland, Perry and York Counties.

Esox vermiculatus Valenciennes. Western Pickerel.

Ohio basin in Armstrong, Clarion, Crawford, Elk, Indiana, McKean, Mercer and Venango Counties.

Esox tridecemlineatus Mitchill. Chain Pickerel.

Delaware basin in Bucks, Carbon, Lehigh, Monroe, Philadelphia, Pike and Wayne Counties.

Susquehanna basin in Bradford, Center, Clearfield, Clinton, Cumberland, Lackawanna, Lebanon, Luzerne, Sullivan, Susquehanna, and Wyoming Counties. Introduced in Lake Erie.

Esox lucius Linnæus. Pike.

Ohio basin in Clarion, Indiana, Mercer, McKean, Warren and Westmoreland Counties.

Erie basin in Erie County.

Esox masquinongy Mitchill. Muskallunge.

Ohio basin in Beaver, Clarion, Crawford and Warren Counties.

Erie basin in Erie County. Introduced in the Delaware basin of Wayne County.

UMBRIDÆ.

Umbra limi (Kirtland). Western Mud Minnow.

Known from my examples obtained at Meadeville in Crawford County.[1]

[1]Proc. Acad. Nat. Sci. Phila., 1912, p. 47.

Umbra pygmæa (De Kay). Eastern Mud Minnow.

Delaware basin in Bucks, Delaware and Philadelphia Counties. Shufeldt recently describes *U. pygmæa bilineata* as a new form, from the tributaries of Chesapeake Bay, which I have discussed elsewhere.[1]

POECILIIDÆ.

Fundulus heteroclitus macrolepidotus (Walbaum). Mummichog.

Delaware basin in Bucks, Delaware and Philadelphia Counties.

Fundulus diaphanus (Le Sueur). Barred Killifish.

Delaware basin in Bucks, Berks, Chester, Delaware, Lehigh, Montgomery, Northampton and Philadelphia Counties.

Susquehanna basin in Berks, Center, Columbia, Dauphin, Lancaster, Lebanon, Snyder and York Counties.

Fundulus diaphanus menona (Jordan and Copeland). Menona Killifish.

My examples from the Allegheny River near Warren and at Erie.

BELONIDÆ.

Strongylura marina (Walbaum) Green Gar.

Delaware basin in Bucks, Delaware and Philadelphia Counties.

Susquehanna basin in Lancaster and York Counties.

Strongylura acus (Lacépède). Houndfish.

A single example in the Academy obtained by E. D. Cope in the lower Susquehanna, within our limits, is an addition to the State's fauna. No exact locality is given. The specimen is 667 mm. long and still in good preservation. Comparison with Massachusetts and Italian material reveal all its characters in harmony. As the species enters our limits by way of Chesapeake Bay it may occur casually in any of the other large rivers tributary. I have, however, not certainly secured it in the Delaware.

ATHERINIDÆ.

Labidesthes sicculus (Cope). Brook Silversides.

My material from the Youghiogheny River and Erie.

PERCOPSIDÆ.

Percopsis omiscomaycus (Walbaum). Trout Perch.

I have this interesting fish from the Jordan Creek in Lehigh County, the only locality in the Delaware basin.[2] In the Ohio basin it is recorded from the Monongahela by Evermann and Bollman,[3] and French Creek above Frenchtown, by McConnell.[4]

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[1] Copeia, No. 50, Oct. 26, 1917, pp. 94–96.

[2] Proc. Acad. Nat. Sci. Phila., 1917, p. 119.

[3] Ann. N. Y. Acad. Sci., III, 1883–5 (1886), p. 339.

[4] Rep. Com. Fisher. Pa., 1905, p. 178.

GASTEROSTEIDÆ.

Eucalia inconstans (Kirtland). Brook Stickleback.

I obtained it in the Allegheny at Foxburg.

Gasterosteus aculeatus Linnæus. Two-spined Stickleback.

I have no local material, though it has been recorded from the Delaware at Philadelphia by Dr. C. C. Abbott.[1] It must be rare or extremely local in our limits, as I never met with it away from the coastal region, or far from salt water. To the contrary the late Dr. Bean says "in Pennsylvania Mr. Seal has found this fish abundant in pools and ditches along the Delaware," a statement[2] which in every way agrees with my knowledge of *Apeltes quadracus.*

Apeltes quadracus (Mitchill). Three-spined Stickleback.

Delaware basin in Bucks, Delaware, Lehigh, Northampton and Philadelphia Counties. Jordan and Evermann state "male almost black; ventrals with the membrane red in spring," though of the countless spawning examples I have examined never a black male has been seen, and most all the males at every season of the year had red ventrals.

APHREDODERIDÆ.

Aphredoderus sayanus (Gilliams). Pirate Perch.

Delaware basin in Bucks, Delaware and Philadelphia Counties.

MICROPTERIDÆ.

Pomoxis annularis Rafinesque. Crappie.

Reported from the Monongahela and my material from the Kiskiminitas River. Likely introduced in the Delaware and Susquehanna basins, where frequently met with.

Pomoxis sparoides (Lacépède). Calico Bass.

Delaware basin in Bucks, Delaware, Monroe, Montgomery, Northampton, Philadelphia and Pike Counties.

Susquehanna basin in Lancaster and York Counties.

Ohio basin in Clarion County

Erie basin in Erie County.

Ambloplites rupestris (Rafinesque). Red-eyed Bass.

Ohio basin in Beaver, Clarion, Fayette, Indiana, Lawrence, McKean, Warren and Westmoreland Counties.

Genesee basin in Potter County.

Erie basin in Crawford and Erie Counties. Introduced in the Delaware and Susquehanna basins.

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[1] *Gasterosteus biaculeatus* Abbott, Geol. N. J., 1868, p. 814.

[2] Rep. Com. Fisher. Pa., 1889–91 (1892), p. 98.

[3] Bull. U. S. Nat. Mus., No. 47, T, 1896, p. 752.

Enneacanthus obesus (Girard). Sphagnum Sunfish.

Only taken in the Delaware basin at Philadelphia, though abundant outside our limits in the Coastal Plain.

Enneacanthus gloriosus (Holbrook). Blue-spotted Sunfish.

Delaware basin in Bucks, Delaware and Philadelphia Counties.
Susquehanna basin in Lancaster and Lebanon Counties.

Mesogonistuis chætodon (Baird). Banded Sunfish.

Delaware basin in Bucks and Philadelphia Counties.

Lepomis cyanellus Rafinesque. Green Sunfish.

No definite record ever given. I include it as the late Eugene Smith informed me he secured several examples from the Monongahela River at McKeesport, over twenty years ago

Lepomis auritus (Linnæus). Red-bellied Sunfish.

Delaware basin in Berks, Bucks, Chester, Delaware, Lehigh, Montgomery, Northampton, Philadelphia, Pike and Wayne Counties.
Elk basin in Chester County.
Susquehanna basin in Berks, Center, Dauphin, Lancaster, Lebanon, Snyder, Sullivan and York Counties.

Lepomis megalotis (Rafinesque). Long-eared Sunfish.

I have it from the Kiskiminitas River, where it was obtained by Cope.

Lepomis macrochirus Rafinesque. Chain-side Sunfish.

Type of *L. nephelus* Cope, from the Kiskiminitas River, examined.

Lepomis incisor Valenciennes. Blue Sunfish.

Besides Cope's type of *L. ardesiacus* from the Kiskiminitas I have it from the Delaware basin in Bucks, Lehigh, Pike and Philadelphia Counties.
Ohio basin in Warren County.
Erie basin in Erie County.

Pomotis gibbosus (Linnæus). Common Sunfish.

Delaware basin in Berks, Bucks, Carbon, Chester, Delaware, Lehigh, Monroe, Montgomery, Northampton, Philadelphia, Pike and Wayne Counties.
Susquehanna basin in Berks, Blair, Bradford, Cambria, Clinton, Center, Columbia, Dauphin, Franklin, Fulton, Huntingdon, Lackawanna, Lancaster, Lebanon, Luzerne, Mifflin, Montour, Northumberland, Perry, Sullivan, Susquehanna, Wyoming and York Counties.
Potomac basin in Fulton County.
Ohio basin in McKean and Indiana Counties.
Erie basin in Erie County.

Micropterus dolomieu Lacépède. Small-mouth Bass.

Ohio basin in Allegheny, Armstrong, Beaver, Butler, Cambria, Clarion,

Clearfield, Crawford, Erie, Fayette, Forest, Indiana, Lawrence, McKean, Mercer, Somerset, Venango and Warren Counties.

Erie basin in Crawford and Erie Counties. Introduced in Delaware, Susquehanna and Potomac basins.

Micropterus salmoides (Lacépède). Large-mouth Bass.

Ohio basin in Crawford, Indiana, McKean and Warren Counties.

Erie basin in Erie County. Introduced in Delaware and Potomac basins.

PERCIDÆ.

Stizostedion vitreum (Mitchill). Pike Perch.

Genesee basin in Potter County.

Ohio basin in Allegheny, Beaver, Butler, Cambria, Clarion, Crawford, Forest, Indiana, Lawrence, McKean, Warren and Westmoreland Counties.

Erie basin in Erie County. Introduced in the Delaware and Susquehanna basins.

Stizostedion canadense (Griffiths). Sauger.

Ohio basin in Indiana and Warren Counties, and Beaver and Youghiogheny Rivers.

Erie basin at Erie.

Perca flavescens (Mitchill). Yellow Perch.

Delaware basin in Bucks, Carbon, Delaware, Lehigh, Monroe, Montgomery, Pike, Philadelphia and Wayne Counties.

Susquehanna basin in Bradford, Lackawanna, Lancaster, Luzerne, Mifflin, Wyoming and York Counties.

Erie basin in Erie County. Introduced in Ohio basin of Crawford County.

Percina caprodes (Rafinesque). Log Perch.

Susquehanna basin in Lancaster County.

Ohio basin in Crawford County. Reported from the Allegheny and Monongahela and I have Cope's Kiskiminitas and Youghiogheny River material.

Erie basin in Erie County.

Haldeman described it as *Perca nebulosa* from the Susquehanna.[1] At the same time he also described *Perca minima* from the same stream, though not the young as he suggests, but simply a tessellated darter. He also gave the manuscript name *Percina bimaculata* to Storer for still another example from the Susquehanna several years later,[2] this insuring the generic name for the log perches. The types of the first two nominal forms I have examined. Cope overlooks[3] the occurrence of the log perch in the Susquehanna, as he only mentions it from Lake Erie and the Allegheny River.

[1] Journ. Acad. Nat. Sci. Phila., 1842, p. 330.

[2] Proc. Boston Soc. Nat. Hist., 1844, p. 157.

[3] Rep. Com. Fisher. Pa., 1879–80 (1881), p. 124.

Hadropterus phoxocephalus (Nelson). Slender-headed Darter.

Reported from the Monongahela by Evermann and Bollman.[1]

Hadropterus macrocephalus (Cope). Long-headed Darter.

Cope's types of *Etheostoma macrocephalum* from the Youghiogheny examined. The late Dr. Bean reports it from French Creek[2] and Foxburg.[3]

Hadropterus peltatus (Cope). Shielded Darter.

Delaware basin in Montgomery County.

Susquehanna basin in Berks, Dauphin, Lancaster and Snyder Counties.

Hadropterus aspro (Jordan). Black-sided Darter.

A number of examples from Indiana County, some I wrongly identified with *H. macrocephalus*.[4]

Etheostoma blennioides Rafinesque. Green-sided Darter.

Reported from the Kiskiminitas and Monongahela Rivers, and my material from the Beaver River.

Boleosoma nigrum (Rafinesque). Johnny Darter.

Ohio basin in Clarion, Indiana and McKean Counties.

Boleosoma nigrum olmstedi (Storer). Tessellated Darter.

Delaware basin in Berks, Carbon, Chester, Delaware, Lehigh, Monroe, Montgomery, Northampton, Philadelphia and Pike Counties.

Susquehanna basin in Berks, Blair, Cameron, Chester, Cumberland, Huntingdon, Columbia, Dauphin, Lancaster, Luzerne, Mifflin, Perry, Snyder, Sullivan and York Counties.

Elk basin in Chester County.

Ammocrypta pellucida (Putnam). Sand Darter.

Reported from the Youghiogheny and the Monongahela. I have it from Erie.

Pœcilichthys variatus (Kirtland). Variegated Darter.

Described as *Hadropterus tessellatus* by Jordan from the Allegheny at Foxburg.[5] Evermann and Bollman report it from the Monongahela,[6] and McConnell mentions it from French Creek above Franklin.[7] The specimen mentioned by Jordan and Evermann from Easton is likely with wrong locality.[8]

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[1]Ann. N. Y. Acad. Sci., III, 1883–5 (1886), p. 339.
[2]Rep. Com. Fisher. Pa., 1889–91 (1892), p. 122.
[3]Bull. U. S. Nat. Mus., No. 27, 1884, p. 466.
[4]Science, XXXI, March 4, 1910, p. 346; Proc. Acad. Nat. Sci. Phila., 1912, p. 49.
[5]Bull. U. S. Nat. Mus., No. 10, 1877, p. 7.
[6]Ann. N. Y. Acad. Sci., III, 1883–5 (1886), p. 339.
[7]Rep. Com. Fisher. Pa., 1905, p. 178.
[8]Bull. U. S. Nat. Mus., No. 47, 1, 1896, p. 1069.

Pœcilichthys zonalis Cope. Zoned Darter.

Recorded from the Monongahela by Evermann and Bollman.[1]

Pœcilichthys maculatus (Kirtland). Trout Darter.

McConnell records it from the Shemango River at Jamestown.[2]

Pœcilichthys cœruleus (Storer). Blue Darter.

Recorded from the Monongahela by Evermann and Bollman, and I have it from the Kiskiminitas.

Pœcilichthys flabellaris (Rafinesque). Fantail Darter.

Ohio basin in Allegheny, Indiana, McKean and Westmoreland Counties.
Susquehanna basin in Perry County.

Boleichthys fusiformis (Girard). Lowland Darter.

Only met with in the Delaware tidal region near Bristol, Bucks County.

SERRANIDÆ.

Roccus chrysops (Rafinesque). White Bass.

Genesee basin in Potter County and Erie basin at Erie. Ohio basin in Clarion, Indiana, Mercer and Warren Counties. Introduced in the Delaware basin.

Roccus lineatus (Bloch). Striped Bass.

Delaware basin in Bucks, Chester, Delaware, Montgomery, Philadelphia and Pike Counties.
Susquehanna basin in Dauphin, Lancaster, Luzerne and York Counties.

Morone americana (Gmelin). White Perch.

Delaware basin in Bucks, Carbon, Delaware, Montgomery, Northampton and Philadelphia Counties.
Susquehanna basin in Lancaster and York Counties.

SCIÆNIDÆ.

Aplodinotus grunniens Rafinesque. Fresh-water Drum.

Ohio basin in the Allegheny and Monongahela, and Indiana County.
Erie basin in Erie County.

COTTIDÆ.

Cottus ictalops (Rafinesque). Western Sculpin.

Genesee basin in Potter County.
Ohio basin in Allegheny, Clarion, Crawford, Indiana, McKean, Somerset and Westmoreland Counties.

Cottus gracilis Heckel. Sculpin.

Delaware basin in Berks, Bucks, Carbon, Chester, Lehigh, Montgomery and Northampton Counties.

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[1]Ann. Acad. Nat. Sci., III, 1883–5 (1886), p. 339.
[2]Rep. Com. Fisher. Pa., 1905, p. 178.

Elk basin in Chester County.

Susquehanna basin in Berks, Center, Columbia, Cumberland, Dauphin, Lancaster, Luzerne, Huntingdon, Perry and Snyder Counties.

SOLEIDÆ.

Achirus fasciatus Lacépède. American Sole.

Delaware basin in Bucks and Philadelphia Counties.

GADIDÆ.

Lota maculosa (Le Sueur). Burbot.

Found at Erie. Introduced in the Susquehanna and Delaware.

Besides the species already indicated as introduced are several others and several which may be considered accidental Such are:

Carcharias taurus Rafinesque. Sand Shark.

Once recorded in the region of the Delaware opposite Philadelphia.

Eulamia milberti Muller and Henle. Brown Shark.

Once found in the Delaware opposite lower Philadelphia.

Raja ocellata Mitchill. Big Spotted Skate.

Once in the Delaware opposite upper Philadelphia.

Oncorhynchus tschawytscha (Walbaum). Quinnat Salmon.

Introduced in the Delaware and Susquehanna.

Salmo salar Linnæus. Salmon.

Introduced in the Delaware.

Salmo salar sebago (Girard). Landlocked Salmon.

Introduced in Luzerne, Monroe, Pike and Wayne Counties.

Salmo fario Linnæus. Brown Trout.

Introduced in Blair, Huntingdon, Luzerne, Monroe, Philadelphia, Pike and Wayne Counties.

Salmo clarkii Richardson. Columbia River Trout.

Introduced in Center and Susquehanna Counties.

Salmo irideus Gibbons. Rainbow Trout.

Introduced in Center, Clearfield, Cumberland, Fayette, Franklin, Montgomery, Pike, Wayne and Wyoming Counties.

Thymallus tricolor Cope. Michigan Grayling.

Introduced.

Cyprinus carpio Linnæus. Carp.

Introduced. Delaware basin in Berks, Bucks, Carbon, Chester, Lehigh, Montgomery, Northampton and Philadelphia Counties.

Susquehanna basin in Adams, Blair, Bradford, Center, Clearfield, Columbia, Huntingdon, Cumberland, Lackawanna, Lancaster, Lebanon, Lycoming, Luzerne, Mifflin, Perry, Snyder, Susquehanna, Union and York Counties.

Ohio basin in Allegheny, Armstrong, Butler, Crawford, Greene, Indiana, Jefferson, Lawrence, Mercer, Somerset, Venango, Washington, Warren and Westmoreland Counties.

Erie basin in Erie County.

Carassius auratus (Linnæus). Goldfish.

Introduced. Delaware basin in Bucks, Lehigh and Philadelphia Counties.

Scardinius erythrophthalmus (Linnæus).

Introduced about Philadelphia.

Pomatomus saltatrix (Linnæus). Blue Fish.

Accidental in the Delaware at Philadelphia.

Chænobryttus gulosus (Cuvier). Warmouth.

Introduced in the Delaware and Susquehanna.

Morone interrupta Gill. Yellow Bass.

Introduced in the Delaware.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

TWO NEW GENERA AND THIRTEEN NEW SPECIES OF AUSTRALIAN THYSANOPTERA.

BY J. DOUGLAS HOOD.

The sixth volume of the Memoirs of the Queensland Museum, issued December 19, 1918, contains an article by the writer in which are described four new genera and twenty-four new species of Thysanoptera collected by Mr. Alexandre A. Girault in North Queensland, Australia. The present paper is supplementary to the one referred to and, together with a brief article in the Bulletin of the Brooklyn Entomological Society, Volume XIII, No. 4, published in October, 1918, completes the description of the new Thysanoptera which have come gradually into the writer's possession through Mr. Girault's efforts. Five of the following new species are from Brooklyn, New South Wales; the remainder are from Queensland. All holotypes and allotypes are in the writer's collection and one set of paratypes will be deposited in the Queensland Museum.

Scirtothrips australiæ, sp. nov.

Female (*macropterous*).—Length about 0.8 mm. Color straw yellow (nearly white); abdominal segments 3–7 each with a basal transverse dark line extending entirely across segment; segment 1 of antenna colorless, segment 2 grayish apically, 3–8 nearly uniform light gray, 4 and 5 each with a narrow, dark ring at base; fore wings nearly uniform light gray, hind wings pale, with dark median line.

Head about 1.5 times as wide as long and about 0.9 as long as prothorax; cheeks nearly straight, subparallel; frontal costa about 0.8 as wide as basal antennal segment. Eyes slightly protruding, about four times as long as their distance from posterior margin of head, 0.8 as wide as their interval, setose. Ocelli approximate, opposite center of eyes, pigment dirty yellow. Antennæ about 2.45 times as long as head, normal to the genus.

Prothorax about 1.62 times as wide as long; pronotum with minute, close, transverse striæ visible only under high magnification and a few scattered dark bristles, the pair at the posterior angles long, stout, and dark, about 1.6 times as long as width of segment 2 of antenna. Pterothorax about 1.23 times as wide as prothorax. Wings of fore pair about ten times as long as greatest subbasal width exclusive of scale, 2.45 times as long as antennæ, and nearly four times as long as width of head; anterior vein with a group of three dark bristles in basal fourth, a group of two in second fourth, one bristle at middle, and two more near tip; posterior vein with one bristle in apical half.

Abdomen with last segment about 1.3 times as long as wide, not divided above; bristles very light brown, normal to the genus.

Measurements of holotype ♀ : Length 0.756 mm.; head, length 0.086 mm., width 0.130 mm.; eyes, length 0.060 mm., width 0.041 mm.; prothorax, length 0.096 mm., width 0.156 mm.; pterothorax, width 0.192 mm.; abdomen, width 0.211 mm.; fore wings, length 0.516 mm., width at middle 0.031 mm., near base 0.051 mm.

Antennal segments:	1	2	3	4	5	6	7	8
Length (μ)	18	34	38	33	36	37	5	10
Width (μ)	21	23	17	17	15	15	7	5

Total length of antenna, 0.211 mm.

Described from one female taken by A. A. Girault at Pentland, Queensland, Australia, January 6, 1913, by sweeping foliage and grass.

The abdominal markings are distinctive.

Anaphothrips speciosus sp. nov.

Female (*macropterous*).—Length about 1 mm. Color dark blackish brown with abdominal segments 3–5 abruptly pale yellow; legs yellow, with femora shaded on outer surface with dark blackish brown; antennal segments 1, 2, and 5–8 slightly lighter than head; segments 3 and 4 yellowish, the latter slightly darker apically; fore wings nearly clear, with a brown transverse band occupying second fifth; hind wings with brown median vein.

Head about 1.08 times as wide as long, about equal in length to prothorax, narrowest at base and widest across eyes, cheeks evenly arched; vertex convex and rounded; occiput with four or five transverse anastomosing lines; all bristles minute, subequal in length to diameter of ocelli. Posterior ocelli situated just behind middle of eyes and forming a nearly right angle with the anterior ocellus, which is slightly smaller. Eyes half as long as head, prominent, protruding, and about two-thirds as wide as their interval. Antennæ nearly 1.9 times as long as head, eight-segmented, segment 6 not divided by a subapical suture; segment 3 with a forked trichome on dorsal surface, segment 4 with a similar one on ventral surface. Mouth cone reaching three-fourths across prosternum; maxillary palpi three-segmented.

Prothorax about one and one-fourth times as wide as long and about equal in length to head; surface smooth, and with a few minute bristles; no

long bristles at posterior angles. Mesothorax about 1.36 times as wide as prothorax and much wider than metathorax. Wings of fore pair with two longitudinal veins reaching nearly to tip; anterior vein with three pale bristles near base, four in the transverse brown band which occupies the second fifth of the wing, and three or four widely separated ones beyond; posterior vein with about eight bristles, which are more widely separated toward apex of wing.

Abdomen slender but distinctly wider than mesothorax, and sharply conical, the last three segments successively shorter; posterior margin of segment 8 pectinate; segment 10 divided above; bristles on 9 and 10 long, dark in color, and prominent.

Measurements of holotype (♀): Length 1.03 mm.; head, length 0.122 mm., greatest width 0.132 mm., least width 0.119 mm.; eyes, length 0.063 mm., width 0.036 mm., interval 0.056 mm.; prothorax, length 0.121 mm., width 0.154 mm.; pterothorax, length 0.216 mm., width 0.209 mm.; fore wings, length 0.648 mm., width at middle 0.047 mm., near base 0.066 mm.; abdomen, greatest width 0.240 mm.; segment 8, length 0,078 mm.; segment 9, length 0.071 mm.; segment 10, length 0.060 mm.

Antennal segments:	1	2	3	4	5	6	7	8
Length (μ)	21	33	39	34	34	46	10	14
Width (μ)	26	24	18	18	17	18	7	5

Total length of antenna, 0.231 mm

Described from one female taken by sweeping grass in a yard at Brooklyn, New South Wales, November 7–18, 1914, by A. A. Girault.

The yellow abdominal band occupying the third, fourth, and fifth segments and the dark prothorax enable this species to be distinguished at once from closely allied forms.

Haplothrips angustus, sp. nov.

Female (*macropterous*).—Length about 1.4 mm. Color blackish brown with inner surface of fore tibiæ, and all tarsi, yellow, lightly shaded with brown; antennal segments 1, 2, and 5–8 dark blackish brown and concolorous with body, 3 light yellowish brown, 4 intermediate in color between 3 and 5, paler basally; wings clear, except the scale and the region of the three subbasal bristles, which are brown.

Head about 1.25 times as long as wide, sides distinctly arcuate and converging to base, which is about 0.85 the width behind eyes; surface faintly subreticulate and with a few minute spines; vertex swollen but not produced, the anterior ocellus slightly overhanging and nearly attaining front margin of eyes; postocular bristles blunt, one-seventh as long as head. Eyes 0.38 as long as head and two-thirds as wide as their interval. Antennæ of normal structure; segment 3 fully twice as long as wide, and without a sense cone on inner surface; segment 4 large; 8 conical and closely united at base to 7. Mouth cone reaching less than half way across prosternum, broadly rounded at apex.

Prothorax narrow, two-thirds as long as head and (inclusive of coxæ)

about 1.8 times as wide as long, surface smooth, median line faintly indicated; all bristles present, blunt, the anterior marginals shortest, the posterior laterals longest, others subequal to postoculars. Wings of fore pair slender, narrowed at middle, and with seven (rarely, six) interlocated hairs on posterior margin near apex. Fore tarsus with a minute tooth.

Abdomen about equal in width to pterothorax. Tube 0.55 as long as head, twice as long as basal width, and less than twice as wide at base as at apex. Bristles largely blunt; terminal bristles shorter than tube.

Measurements of holotype (♀): Length 1.39 mm.; head, length 0.209 mm., greatest width 0.166 mm., width at base 0.141 mm.; eyes, length 0.080 mm., width 0.045 mm., interval 0.066 mm.; postocular bristles, length 0.030 mm.; prothorax, length 0.138 mm., width (inclusive of coxæ) 0.257 mm.; pterothorax, length 0.312 mm., width 0.292 mm.; abdomen, greatest width 0.286 mm.; tube, length 0.115 mm., width at base 0.057 mm., at apex 0.032 mm.

Antennal segments:	1	2	3	4	5	6	7	8
Length (μ)	33	44	49	51	44	40	38	26
Width (μ)	32	27	23	30	26	22	19	13

Total length of antenna, 0.325 mm.

Male (*macropterous*).—Length about 1.3 mm. Color and structure essentially as in female, except as follows: Head about 1.34 times as long as wide, 0.89 as wide at base as behind eyes. Eyes 0.35 as long as head and three-fourths as wide as their interval. Prothorax 0.77 as long as head and (inclusive of coxæ), 1.7 times as wide as long, median line distinctly indicated, black. Fore legs swollen, tarsi with a stout triangular tooth.

Measurements of allotype (♂): Length 1.26 mm.; head, length 0.209 mm., greatest width 0.156 mm., width at base 0.139 mm.; eyes, length 0.074 mm., width 0.045 mm., interval 0.062 mm.; postocular bristles, length 0.033 mm.; prothorax, length 0.161 mm., width (inclusive of coxæ) 0.276 mm.; pterothorax, length 0.294 mm., width 0.281 mm.; abdomen, greatest width 0.276 mm.; tube, length 0.114 mm., width at base 0.056 mm., at apex 0.031 mm.

Antennal segments:	1	2	3	4	5	6	7	8
Length (μ)	31	42	49	50	44	40	37	26
Width (μ)	32	26	23	28	24	22	18	13

Total length of antenna, 0.319 mm.

Described from three females and one male taken by sweeping grass, at Brooklyn, New South Wales, Nov. 7–18, 1914, by A. A. Girault.

Easily known from the other Australian species of the genus by the long third antennal segment which has no sense cone on its inner surface, and by the antennal coloration.

Zygothrips pallescens, sp. nov.

Female (*macropterous*).—Length about 1.5 mm. Color brownish yellow, with metathorax, first abdominal segment, all tarsi, apical half of tibiæ, and antennal segments 3–6, pale yellow; tube dark brown, paler apically.

Head about 1.5 times as long as wide, broadest midway between eyes and base, cheeks nearly parallel but converging very slightly to eyes and more rapidly to base of head; dorsal and lateral surfaces without sculpture, set with a few minute spines; vertex slightly produced, overhanging, and bearing the anterior ocellus at its extremity, which slightly surpasses the anterior margin of eyes; postocular bristles less than half as long as eyes, conically expanded at tip. Eyes nearly one-third as long as head, not protruding. Anterior ocellus directed forward, posterior ocelli just in advance of a line drawn through middle of eyes. Antennæ about 1.6 times as long as head; segments 7 and 8 scarcely compactly united; sense cones short and slender; formula: 3, 0–1; 4, 2–2; 5, 1–1+[1]; 6, 1–0+[1]; 7 with one on dorsum near apex; segments 1 and 2 brown, darker than head, 2 paler toward apex; 3–6 pale yellow; 7 and 8 brownish yellow, paler than 1 and 2. Mouth cone blunt, much shorter than width of head, reaching about two-thirds across prosternum; labrum about attaining tip of labium.

Prothorax slightly more than half as long as head and (inclusive of coxæ) about twice as wide as long; surface smooth; no median thickening; all usual bristles present, conically expanded at tip, the two pairs at the posterior angles subequal in length to postoculars, the others and the coxal shorter and of nearly equal length. Pterothorax distinctly wider than prothorax, sides converging posteriorly. Legs moderately long, fore femora not swollen, fore tarsi unarmed. Wings clear, slightly narrowed at middle, without accessory hairs on posterior margin; subbasal bristles capitate, the outer one longest and subequal to postocular.

Abdomen normal; bristles largely capitate, all three pairs on segment 9 expanded at apex and two-thirds as long as tube, the terminal bristles equal in length to tube. Tube somewhat more than half as long as head, twice as long as basal width, and nearly twice as wide at base as at apex.

Measurements of holotype (♀): Length 1.52 mm.; head, length 0.240 mm., greatest width 0.161 mm., least width 0.144 mm.; eyes, length 0.076 mm., width 0.045 mm., interval 0.062 mm.; postocular bristles, length 0.033 mm.; prothorax, length 0.126 mm., width (inclusive of coxæ) 0.258 mm.; pterothorax, length 0.348 mm., width 0.300 mm.; abdomen, greatest width 0.294 mm.; tube, length 0.128 mm., width at base 0.064 mm., at apex 0.034 mm.

Antennal segments:	1	2	3	4	5	6	7	8
Length (μ)	36	51	56	62	56	50	44	28
Width (μ)	35	28	28	30	26	24	22	12

Total length of antenna, 0.383 mm.

Described from two macropterous females taken by sweeping in a forest, at Ayr, North Queensland, November 6, 1912, by A. A. Girault.

The coloration and unarmed fore tarsi are distinctive.

Zygothrips inermis, sp. nov.

Female (*macropterous*).—Length about 1.4 mm Color dark brown, with tarsi yellow and the apical portions of tibiæ and the third antennal segment brownish yellow; tube paler at base and in apical third.

Head about 1.3 times as long as wide, broadest at basal third, thence gradually narrowing to eyes and to base; vertex not produced nor overhanging; postocular bristles nearly as long as eyes, capitate. Eyes about one-fourth as long as head, not protruding. Anterior ocellus directed forward and upward, not overhanging; posterior ocelli slightly in front of a line drawn through middle of eyes. Antennæ about 1.7 times as long as head; segments 7 and 8 closely but not compactly united; sense cones short and slender; formula: 3, 1–1; 4, 2–2; 5, 1–1+1; 6, 1–0+1; 7 with one on dorsum near apex; segments 1, 2 and 5–8 concolorous with head, except 2 which is lighter toward apex; 3 much lighter, darker at apex than at base; 4 slightly lighter than 5 but distinctly darker than 3. Mouth cone blunt, much shorter than width of head, reaching about to middle of prosternum; labrum about attaining tip of labium.

Prothorax three-fourths as long as head and (inclusive of coxæ) nearly twice as wide as long; surface smooth; median thickening distinct; anterior marginal bristles minute, others (including coxal) conically expanded at tip and subequal to postoculars. Pterothorax slightly narrower than prothorax, sides converging posteriorly. Legs moderately short, fore femora moderately stout, fore tarsus unarmed. Wings slightly narrowed near middle; subbasal bristles on fore wings conically expanded at tip, slightly shorter than postoculars.

Abdomen normal; bristles largely capitate, the two lateral pairs on segment 9 pointed and much longer than tube, the dorsal pair capitate and shorter than tube, the terminal bristles fully twice as long as tube. Tube slightly less than 0.6 as long as head, nearly twice as long as basal width, and not quite twice as broad at base as at apex.

Measurements of holotype (♀): Length 1.36 mm.; head, length 0.196 mm., greatest width 0.149 mm.; eyes, length 0.054 mm., width 0.037 mm., interval 0.057 mm.; postocular bristles, length 0.050 mm.; prothorax, length 0.145 mm., width (inclusive of coxæ) 0.282 mm.; pterothorax, width 0.270 mm.; abdomen, greatest width 0.313 mm.; tube, length 0.110 mm., width at base 0.060 mm., at apex 0.033 mm.

Antennal segments:	1	2	3	4	5	6	7	8
Length (μ)	37	47	45	49	42	39	42	28
Width (μ)	32	29	27	27	24	22	19	13

Total length of antenna, 0.329 mm.

Described from one macropterous female taken by sweeping grass in a forest, at Aloomba, North Queensland, July 7, 1912, by A. A. Girault.

Distinguished from all other members of its genus by the unarmed fore tarsi and the unusually long bristles at the tip of the tube.

Zygothrips cingulatus, sp. nov.

Female (*macropterous*).—Length about 1.2 mm. Head, thorax, last three abdominal segments, the two basal and two apical antennal segments, and most of fore and mid femora, dark brown; remaining segments of abdomen, all of hind legs, fore and mid tibiæ and tarsi, apices of fore and mid femora, and antennal segments 3–6 pale yellow; wings colorless.

Head about 1.38 times as long as wide, broadest at basal third, sides converging roundly to eyes and to base of head, narrowest at posterior angle of eyes; extreme base of head and cheeks with a few faint anastomosing lines and a few minute colorless spines; vertex arched and forming a low ridge extending forward between basal segments of antennæ, not overhanging; postocular bristles about 0.8 as long as eyes, expanded at tip. Eyes about one-third the length of head, distinctly protruding posteriorly. Anterior ocellus directed forward and upward, not overhanging; posterior ocelli just in advance of a line drawn through middle of eyes. Antennæ about 1.9 times as long as head; segments 7 and 8 not closely united; sense cones slender; formula: 3, 1–1; 4, 1–2; 5, $1\text{–}1+^{1}$; 6, $1\text{–}1+^{1}$; 7 with one on dorsum near apex; segments 1 and 2 brown, concolorous with head, 2 paler at apex; 3–6 pale yellow, almost colorless, 6 slightly infuscate; 7 and 8 brown, lighter than head. Mouth cone blunt, much shorter than width of head, reaching about two-thirds across prosternum; labrum constricted before apex, about attaining tip of labium.

Prothorax about 0.6 as long as head and (inclusive of coxæ) about twice as wide as long; surface smooth, no median thickening; all usual bristles present, expanded at tip, the two pairs at the posterior angles equal to postoculars, the others and coxal half as long. Pterothorax about equal in width to prothorax, sides roundly converging in posterior half. Legs moderately short, fore femora not at all swollen, fore tarsi unarmed. Wings clear, very weak and slender, slightly narrowed at middle, hind margin without accessory hairs; subbasal bristles capitate, the outer one longest and subequal to postocular.

Abdomen normal; bristles largely capitate, all three pairs on segment 9 pointed and subequal in length to tube, the terminal bristles distinctly longer than tube. Tube about two-thirds as long as head, slightly more than twice as long as basal width, and nearly twice as wide at base as at apex.

Measurements of holotype (♀): Length 1.19 mm.; head, length 0.174 mm., greatest width 0.126 mm., least width 0.115 mm.; eyes, length 0.060 mm.; width 0.036 mm., interval 0.045 mm.; postocular bristles, length 0.050 mm.; prothorax, length 0.103 mm., width (inclusive of coxæ) 0.208 mm.; pterothorax, length 0.240 mm., width 0.204 mm.; abdomen, greatest width 0.211 mm.; tube, length 0.112 mm., width at base 0.051 mm., at apex 0.027 mm.

Antennal segments:	1	2	3	4	5	6	7	8
Length (μ)	33	43	42	47	46	45	40	34
Width (μ)	32	42	24	26	23	21	19	11

Total length of antenna, 0.330 mm.

Described from two females, both taken by sweeping in forest at Nelson, North Queensland, by A. A. Girault. One was collected July 7, 1912, and the other December 4, 1913.

Distinguished by the coloration and the unarmed fore tarsi.

Podothrips xanthopus, sp. nov.

Female (*macropterous*).—Length about 1.5 mm. Surface shining. Color dark blackish brown, with apex of fore femora, all tibiæ and tarsi, abdominal segments 1–4, and antennæ beyond basal half of segment 2, yellow; segment 8 of antennæ shaded with gray; abdominal segments 5 and 6 yellowish brown, and, together with 3 and 4, each with a dark brown spot on dorsal surface near base; wings of both pairs light gray.

Head about 1.5 times as long as wide, broadest slightly behind eyes, thence narrowing roundly and abruptly to base, where there is a slight neck-like constriction; vertex rounded and evenly declivous; dorsal surface without sculpture; cheeks smooth, sparsely and briefly spinose; postocular bristles knobbed, half as long as eyes, situated close to lateral margins of head. Eyes one-third as long as head and a little more than half as wide as their interval, not protruding, ventral extent less than dorsal. Ocelli anterior in position, the median one situated anterior to front margin of eyes and between basal segments of antennæ, the posterior pair situated about half their diameter in front of a line drawn through middle of eyes. Antennæ of normal form, nearly 1.5 times as long as head; sense cones and bristles short and weak. Mouth cone blunt, broadly rounded, much shorter than its width at base.

Prothorax three-fourths as long as head and (inclusive of coxæ) twice as wide near base as at apex and two-thirds as long as wide; lateral outline distinctly concave; surface smooth; median dorsal line chitinized for about one-third its length; all usual bristles present, the anterior marginal and mid-lateral pairs pointed, visible only under the highest magnifications; the two pairs near the posterior angles and the coxal pair knobbed, subequal to postoculars; anterior angulars similarly knobbed, but only half as long. Pterothorax much narrower than prothorax, sides nearly straight and very slightly converging posteriorly. Legs rather short and stout; fore femur much shorter than and only half as wide as head; fore tibia with a small, blunt, setose tooth on inner surface of apex; fore tarsus with a slender, acute, curved tooth about half as long as width of tarsus, the inner surface of tooth with a bristle arising from near middle. Wings slender, weak, without double subapical fringe.

Abdomen slender, about as wide as prothorax. Tube about 0.5 as long as head, basal fourth slightly swollen and twice as wide as apex; bristles pale, mostly knobbed.

Measurements of holotype (♀): Length 1.5 mm.; head, length 0.228 mm , greatest width 0.156 mm., least width 0.118 mm.; eyes, length 0.072 mm., width 0.039 mm., interval 0.069 mm ; postocular bristles, length 0.036 mm.; prothorax, length 0.172 mm., width (inclusive of coxæ) 0.259 mm.; pterothorax, length 0.288 mm., width 0.228 mm.; abdomen, greatest width 0.252 mm.; tube, length 0.120 mm., width at base 0.056 mm., at apex 0.029 mm.

Antennal segments:	1	2	3	4	5	6	7	8
Length (μ)	35	47	45	48	43	43	46	30
Width (μ)	34	28	26	28	25	22	19	11

Total length of antenna, 0.337 mm.

Described from a unique female collected by A. A. Girault at Nelson, North Queensland, April 12, 1914, by sweeping in forest.

Easily known by the coloration and the absence of an acute lateral tooth on cheeks behind eyes.

Genus **Asemothrips**, nov.

(ἄσημος, without device; θριψ, a wood worm.)

Head much longer than wide. Eyes moderate in size, rounded. Antennæ eight-segmented, the last two segments compactly joined, separated only by an oblique suture; fifth segment obliquely truncate at outer surface of apex. Mouth cone short and broadly rounded at apex, the labrum scarcely surpassing labium and with sides straight. Prothorax shorter than head. Fore femora swollen and fore tarsi strongly armed in both sexes. Wings of nearly equal width throughout, not narrowed at middle. Bristles short and knobbbed in the type species.

Genotype: *Asemothrips picturatus*, sp. nov.

The type of the present genus is a species of ordinary appearance but one which I have found impossible to assign to any existing genus on account of the union of the seventh and eighth antennal segments, the obliquely truncate apex of the fifth antennal segment, and the short broadly rounded mouth cone. Notwithstanding the form of the wings, which are scarcely narrowed at the middle, the insect is apparently referable to the *Haplothrips* group.

Asemothrips picturatus, sp. nov.

Male (*macropterous*).—Length about 1.5 mm. Color light yellow, with first two segments of antennæ, frons, a longitudinal stripe behind each eye, lateral and dorsal pterothoracic plates, sides of first abdominal segment, all of ninth abdominal segment, and tube, abruptly dark brown, the postocular stripe and middle of tube darkest; antennæ with apex of segment 5, apical two-fifths of segment 6, and all of segments 7 and 8, light brown; fore femora shaded with brown on outer surface, middle and hind tibiæ brown basally, second abdominal segment slightly darkened at anterior angles; wings clear.

Head about 1.6 times as long as wide, dorsal and lateral surfaces nearly smooth and with a few minute spines; cheeks converging roundly to eyes and more gradually to near base of head, thence subparallel; vertex produced to form a slight hump, and with anterior margin nearly vertical; postocular bristles short, less than half as long as eyes, knobbed, and situated close to sides of head. Eyes about one-third as long as head, prominent and slightly protruding, nearly as wide as their interval. Anterior ocellus directed forward and somewhat overhanging; posterior ocelli situated in front of a line drawn through middle of eyes. Antennæ about 1.55 times as long as head; segment 5 prominently obliquely truncate on outer surface of apex; segment 6 with the pedicel correspondingly truncate; segments 7 and 8 compactly joined and separated by an oblique suture, segment 8 being longer on ventral than on dorsal surface; sense cones disposed as

follows: 3, 1–1; 4, $1+^{1}$–2; 5, $1–1+^{1}$; 6, $1–1+^{1}$; 7 with one on dorsum near apex; three bristles on ventral surface of segment 7 and six on ventral surface of 8, forming a straight comb. Mouth cone short and broadly rounded at apex, reaching about half across prosternum, the labrum scarcely surpassing labium.

Prothorax about two-thirds as long as head and (inclusive of coxæ) nearly 1.9 times as wide as long; pronotum smooth, with distinct but colorless median thickening; all usual bristles present, the anterior marginals minute and pointed, all others and coxal subequal to or slightly shorter than postoculars, prominently knobbed. Wings of nearly equal width throughout; fore pair without accessory hairs on posterior margin near tip, with the first two of the subbasal bristles similar to the prothoracic ones, and with the third subbasal bristle much longer and pointed. Fore tarsi with a strong curved tooth as long as width of tarsus.

Abdomen of normal form and structure. Tube about 0.55 as long as head and about 2.2 times as long as basal width, which is about 1.8 times the apical, sides straight. Abdominal bristles moderately short, capitate, the longest pair on segment 9 slightly more than half as long as tube; terminal bristles pointed, nearly as long as tube.

Measurements of holotype (♂): Length, 1.51 mm.; head, length 0.264 mm., greatest width 0.167 mm., width at base 0.144 mm.; eyes, length 0.084 mm., width 0.051 mm., interval 0.057 mm.; postocular bristles length 0.036 mm.; prothorax, length 0.175 mm., width (inclusive of coxæ) 0.328 mm.; pterothorax, length 0.288 mm., width 0.305 mm.; abdomen, greatest width 0.276 mm.; tube, length 0.144 mm., width at base 0.065 mm., at apex 0.036 mm.

Antennal segments:	1	2	3	4	5	6	7	8
Length (μ)	42	54	63	63	63	64	44	24
Width (μ)	39	30	25	29	27	27	21	12

Total length of antenna, 0.417 mm.

Female (*macropterous*).—Similar in coloration and structure to male. Fore femora about as strongly swollen as in that sex, and fore tarsi about as strongly armed.

Described from three males and one female, all taken by Mr. A. A. Girault by sweeping in a forest at Nelson, North Queensland. The four specimens were taken September 12, 1912; May 29, 1913; January 8, 1914; and May 21, 1914. The female is in very poor condition, and is mounted in balsam under eleven separate coverglasses.

This is a very pretty species. Aside from the important structural characters which have made a new genus necessary for its reception, it may be known by the unusual coloration.

Trichothrips connexus, sp. nov.

Female (*macropterous*).—Length about 1.5 mm. Color yellowish brown, with segment 3 of antennæ, tips of femora, all tibiæ and tarsi, and tube, yellow; wings of both pairs uniform light brown; hypodermal pigment crimson.

Head as long as wide, broadest and slightly swollen just behind eyes, cheeks converging to base of head and smooth, save for a few minute spines; postocular bristles one-third as long as head, nearly pointed. Eyes one-third as long as head, rounded, somewhat protruding, and about 0.7 as wide as their interval. Anterior ocellus situated in front of anterior margin of eyes and slightly overhanging base of antennæ, the two posterior ones with their hind margins opposite center of eyes. Antennæ nearly two and one-third times as long as head, segment 8 conical and broadly united at base to segment 7; sense cones long and distinct, formula: 3, 1–1; 4, 1–1; 5, 1–1+1; 6, 1–1+1; 7 with one on dorsum near apex; segments 1 and 2 and 4–8 nearly concolorous with body, the apical segments slightly paler; segment 3 abruptly light yellow. Mouth cone reaching about two-thirds across prosternum and broadly rounded at tip; labrum not surpassing labium.

Prothorax about 0.84 as long as head and (inclusive of coxæ) about 1.9 times as wide as long; anterior marginal bristles very minute; others distinct, nearly pointed, the three posterior pairs subequal, fully as long as postoculars and about twice as long as anterior laterals; coxal bristle nearly as long as midlateral. Pterothorax distinctly wider than prothorax, sides slightly converging posteriorly. Wings of nearly equal width throughout, fore pair without accessory hairs on posterior margin and with only one subbasal bristle, instead of three. Fore tarsus with a long, slender, nearly straight tooth arising at right angles to the tarsus.

Abdomen of normal shape, distinctly wider than pterothorax. Tube about 0.87 as long as head, about 1.9 times as long as basal width, and more than twice as broad at base as at apex. Bristles long, scarcely pointed, those on the ninth segment about 0.8 as long as the tube; terminal bristles two-thirds the length of tube.

Measurements of holotype (♀): Length 1.48 mm.; head, length 0.192 mm., greatest width 0.192 mm., width at base 0.168 mm.; eyes, length 0.063 mm., width 0.054 mm., interval 0.075 mm.; postocular bristles, length 0.063 mm.; prothorax, length 0.162 mm., width (inclusive of coxæ) 0.307 mm.; pterothorax, length 0.348 mm., width 0.360 mm.; abdomen, greatest width 0.433 mm.; tube, length 0.168 mm., width at base 0.088 mm., at apex 0.039 mm.; fore wings, length 0.960 mm., width at middle 0.096 mm.

Antennal segments:	1	2	3	4	5	6	7	8
Length (μ)	51	60	63	63	65	60	49	36
Width (μ)	41	36	37	35	34	32	26	18

Total length of antenna, 0.447 mm.

Described from a single specimen taken by sweeping in a forest, at Brooklyn, New South Wales, November 10–13, 1914, by Mr. A. A. Girault.

Distinguished at once by the union of the two apical antennal segments and the antennal coloration.

Genus **Teuchothrips,** nov.

(τεῦχος, an implement of war; θριψ, a wood worm.)

Head broad, not more than 1.2 times as long as wide, subequal to or much longer than prothorax; vertex either slightly produced and overhanging or with the front margin nearly straight and vertical, the anterior ocellus overhanging; cheeks and occiput distinctly (sometimes deeply) subreticulate, the former arcuate to eyes and base of head. Eyes of moderate size, somewhat shorter and narrower on ventral surface. Antennæ eight-segmented, the last two segments usually compactly united and forming a single mass. Mouth cone rounded at apex, reaching half way or more across prosternum, the labrum not surpassing labium. Prothorax from 0.6 to 0.9 as long as head, bristles usually short and capitate. Fore tarsi with a long, stout, curved tooth. Wings broad, closely fringed, not narrowed at middle. Tube long, usually nearly equal in length to head, sides straight.

Genotype: *Teuchothrips simplicipennis*, sp. nov.

This genus comprises, in addition to the two new species *simplicipennis* and *badiipennis* described below, four species, also from Australia, which were described by the author under the generic name *Liothrips*.[1] These four species should thus be known as *Teuchothrips disjunctus, T. connatus, T. gracilior,* and *T. brevidens.* The present genus appears to be separable as a natural segregate of the genus *Liothrips*, differing in the short, reticulated head, the broadly rounded mouth cone, the strongly armed fore tarsi, and the frequent union of the two distal antennal segments.

Teuchothrips simplicipennis, sp. nov.

Female (*macropterous*).—Length about 2 mm. Color dark blackish brown or black, with mid and hind tarsi brown, and distal ends of fore tibiæ, and basal half of segment 3 of antennæ, yellow; wings clouded with brown, the fore wings darker than hind ones and with the scale and the region of the three subbasal bristles much darker; hind wings paler in anterior half, the line of demarkation darkened, especially at base.

Head very slightly wider than long, entire dorsal surface deeply and distinctly reticulate with anastomosing lines; cheeks converging to eyes and base of head, which is about 0.92 of the greatest width; vertex not or only very slightly produced, anterior margin nearly straight and vertical; postocular bristles short, about one-third as long as eyes, dark in color, capitate. Eyes about 0.4 as long as head, not protruding, two-thirds as wide as their interval; ventral length about five-sevenths of dorsal, ventral width a little more than half of ventral interval. Anterior ocellus slightly overhanging, directed forward. Antennæ of normal structure, about 2.19 times as long as head, segments 7 and 8 compactly united to form a single mass, 8 short, about 1.8 times as long as greatest basal width; sense cones short and inconspicuous, formula: 3, 0–1; 4, 1–2+[1]; 5, 1–1+[1]; 6, 1–1+[1]; 7 with one on dorsum near apex; segments 1, 2 and 4–8 dark blackish brown, with apex

[1]Memoirs of the Queensland Museum, Vol. VI, pp. 134–138; Dec. 19, 1918.

of 2 and pedicels of 4–6 slightly paler, 3 yellow in basal half, remainder brown. Mouth cone narrowly rounded at tip, reaching three-fourths across prosternum, labrum not surpassing labium.

Prothorax about 0.9 as long as head and (inclusive of coxæ) not quite 1.9 times as wide as long; pronotum smooth at middle, margins with strong anastomosing lines; median thickening short; all usual bristles present, the anterior marginals minute and pointed, others short, stout, capitate, pale in color, and from one-third to one-half as long as eyes. Wings broad, the fore pair without accessory hairs on posterior margin and with the three subbasal bristles short, pale, and capitate. Fore tarsus with a strong curved tooth longer than half the width of tarsus.

Abdomen of normal form and structure. Tube equal in length to head and 2.3 times as long as the basal width, which is 2.3 times the apical, sides straight. Abdominal bristles rather short, capitate, those on segment 9 about half as long as tube; terminal bristles three-fourths as long as tube.

Measurements of holotype (♀): Length 2.00 mm.; head, length 0.236 mm., greatest width 0.240 mm., least width (near base) 0.222 mm.; eyes, length 0.096 mm., width 0.063 mm., interval 0.090 mm.; postocular bristles, length 0.030 mm.; prothorax, length 0.211 mm., width (inclusive of coxæ) 0.396 mm.; pterothorax, length 0.396 mm., width 0.499 mm.; abdomen, greatest width 0.600 mm.; tube, length 0.236 mm.; width at base 0.102 mm., at apex 0.044 mm.

Antennal segments:	1	2	3	4	5	6	7	8
Length (μ)	51	66	80	75	73	68	70	33
Width (μ)	41	37	33	38	36	35	31	18

Total length of antenna, 0.516 mm.

Described from two females taken by sweeping in forest, at Brooklyn, New South Wales, November 1 and 9, 1914, by A. A. Girault.

Easily known by the brown wings and the absence of interlocated hairs on the posterior margin of the fore wings.

Teuchothrips badiipennis, sp. nov.

Female (*macropterous*).—Length about 1.7 mm. Color dark blackish brown or black, with mid and hind tibiæ brown, and distal ends of fore tibiæ yellow; antennæ with segments 1, 2, 7 and 8 concolorous with head, 2 yellow at apex, 3–6 lemon yellow, 4 infuscate in apical third, 5 in apical half, and 6 in apical three-fifths, this infuscation darkest on sides of segments; wings brown, the fore wings darker than hind ones and slightly paler at apex and in the region of the three subbasal bristles; hind wings paler in anterior half and with median vein darker.

Head about 1.2 times as long as wide, entire dorsal surface distinctly reticulate with anastomosing lines; cheeks gently arched, slightly converging to eyes and base of head; vertex not produced nor overhanging, the anterior margin straight and vertical; postocular bristles capitate, about 0.7 as long as eyes, almost colorless. Eyes a little more than one-third as long as head, not protruding, five-sixths as wide as their interval; ventral

length and width distinctly less than dorsal. Anterior ocellus slightly overhanging, directed forward. Antennæ about 1.75 times as long as head, segments 5 and 6 obliquely truncate on outer surface at apex, causing the antennæ to curve outward; segments 7 and 8 compactly united to form a single mass, 8 short, about 1.7 times as long as greatest basal width; sense cones short and inconspicuous, formula: 3, 0–1; 4, 1–1+[1]; 5, 1–1+[1]; 6, 1–1+[1]; 7 with one on dorsum near apex. Mouth cone broadly rounded at apex, reaching three-fourths across prosternum, labrum not surpassing labium.

Prothorax three-fourths as long as head and (inclusive of coxæ) about twice as wide as long; pronotum smooth at middle, margins with faint anastomosing lines; median thickening almost wanting; all usual bristles present, the anterior marginals minute and pointed, others capitate and light brown in color, shorter than postoculars, the outer pair at posterior angles longest. Wings broad, the fore pair with about eleven accessory hairs on posterior margin and with the three subbasal bristles short, pale, capitate, and subequal in length. Fore tarsus with a stout curved tooth as long as half the width of tarsus.

Abdomen of normal form and structure. Tube about 0.8 the length of head and more than twice as long as the basal width, which is somewhat more than twice the apical, sides straight. Abdominal bristles rather long and capitate, those on segment 9 two-thirds as long as tube; terminal bristles equal in length to tube.

Measurements of holotype (♀): Length 1.70 mm.; head, length 0.244 mm., greatest width 0.208 mm., least width (near base) 0.196 mm.; eyes, length 0.087 mm., width 0.060 mm., interval 0.072 mm.; postocular bristles, length 0.060 mm.; prothorax, length 0.185 mm., width (inclusive of coxæ) 0.366 mm.; pterothorax, length 0.384 mm., width 0.456 mm.; abdomen, greatest width 0.508 mm.; tube, length 0.204 mm., width at base 0.096 mm., at apex 0.045 mm.

Antennal segments:	1	2	3	4	5	6	7	8
Length (μ)	48	62	60	60	62	59	51	30
Width (μ)	42	35	32	36	33	33	27	18

Total length of antenna, 0.432 mm.

Described from three females taken by sweeping in forest and in a yard at Brooklyn, New South Wales, November 1 and 7–18, 1914, by A. A. Girault.

Separable by the brown wings, the yellow bases of antennal segments 3–6, and the presence of accessory hairs on the posterior margin of the fore wings.

Cryptothrips acanthus, sp. nov.

Female (*macropterous*).—Length about 2.3 mm. Color dark blackish brown, with tarsi, fore tibiæ, and articulations of legs paler; abdomen nearly black; antennæ concolorous with body, except segment 3 which is abruptly brownish yellow and more darkly clouded with brown in apical

half, and extreme apex of segment 2, which is yellowish; wings lightly clouded with brown along margins and at middle.

Head about 1.4 times as long as greatest width, which is at extreme posterior angles of eyes; cheeks straight and converging to near base, where the head is about 0.82 of the greatest width, thence very slightly diverging, without distinct collar, faintly striate, and with about six distinct dark spines visible in profile; vertex not at all produced; postocular bristles pointed, half as long as head. Eyes small, less than 0.3 as long as head, two-thirds as wide as their interval, subquadrangular as seen from above, slightly protruding, longer and broader on dorsal surface than on ventral. Anterior ocellus on a line with front margin of eyes and directed forward, not overhanging; posterior ocelli situated in front of middle of eyes and widely separated. Antennæ formed as usual in the genus, 1.7 times as long as head, the last two segments not closely united; segments 3 and 4 each with a large sense cone at middle of ventral apical surface, 3 with an additional one on outer surface; 4 with three additional large ones on inner, outer and upper surfaces, respectively, and also with a small slender one on the inner, upper surface; 5 with a large sense cone on either side of apex and two small ones on dorsum; 6 with a large sense cone on inner surface of apex and a small one on dorsum; 7 with a large one on dorsum near apex. Mouth cone semicircularly rounded at apex and reaching half way across prosternum, labrum not surpassing labium.

Prothorax along median dorsal line less than half the length of head, with distinct median thickening, surface smooth; all usual bristles present, scarcely pointed, the two pairs near posterior angles longest but much shorter than postoculars, the anterior marginals very small, all others (including coxal) less than half as long as postoculars. Fore wings broad, slightly dilated apically, and with about 20 accessory hairs; subbasal bristles small, pale, and pointed, the basal one smallest, the others successively larger. Fore tarsi with a short triangular tooth.

Abdomen broad and heavy. Tube slightly longer than head and more than three times as long as basal width, which is 2.3 times the apical, sides straight. Bristles very long and pointed, yellow, those on segment 9 longer than tube; terminal bristles brown and two-thirds as long as tube.

Measurements of holotype (♀): Length 2.28 mm.; head, length 0.362 mm., greatest width (across eyes) 0.260 mm., least width (at base) 0.212 mm.; eyes, length 0.098 mm., width 0.072 mm., interval 0.108 mm.; postocular bristles, length 0.180 mm.; prothorax, length 0.172 mm., width (inclusive of coxæ) 0.450 mm.; pterothorax, length 0.468 mm., width 0.492 mm.; abdomen, greatest width 0.594 mm.; tube, length 0.396 mm., width at base 0.126 mm., at apex 0.054 mm.

Antennal segments:	1	2	3	4	5	6	7	8
Length (μ)	66	78	98	108	96	71	51	46
Width (μ)	51	39	39	41	37	34	27	18

Total length of antennæ, 0.614 mm.

Described from one female taken by A. A. Girault at Nelson, North Queensland, April 2, 1914, by sweeping in jungle.

Readily known by the long tube and armed fore tarsi.

Cryptothrips claripennis, sp. nov.

Female (*macropterous*).—Length about 2 mm. Color dark blackish brown, with tarsi, fore tibiæ, and articulations of legs paler; antennal segments 3–5 and apex of segment 2, yellow, 3 faintly darkened with brown at apex, 4 and 5 brown in apical third and three-fifths, respectively, the remainder of antennæ concolorous with body; wings clear.

Head about 1.3 times as long as greatest width, which is about midway between eyes and base; cheeks evenly arched, converging more rapidly posteriorly, where the head is about 0.85 of the greatest width, faintly transversely striate, and with a few minute barely-visible spines; vetex roundly swollen and slightly produced, though scarcely overhanging, with a pair of pointed bristles half as long as postoculars situated between posterior ocelli; postocular bristles scarcely pointed, nearly half as long as head. Anterior ocellus overhanging and directed forward, situated far in advance of anterior margin of eyes, which is on a line with anterior margin of the widely separated posterior ocelli. Eyes about 0.3 the length of head and two-thirds as wide as their interval, not protruding. Antennæ formed as usual in the genus, about twice as long as head, the last two segments scarcely closely united; segments 3 and 4 each with a large sense cone at middle of ventral apical surface, 3 with an additional one on outer surface, 4 with three additional ones on inner, outer, and upper surfaces, respectively; 5 with a large sense cone on either side of apex and a small one on dorsum; 6 with a large sense cone on inner surface of apex and a small one on dorsum; 7 with a large one on dorsum. Mouth cone semicircularly rounded at apex and reaching three-fourths across prosternum, labrum not surpassing labium.

Prothorax along median dorsal line about half the length of head, with distinct median thickening, surface smooth; all usual bristles present, scarcely pointed, the two pairs near posterior angles longest but scarcely equal in length to postoculars, anterior marginals two-thirds as long as anterior angulars and one-fourth as long as postoculars, coxal bristles equal to anterior angulars. Fore wings broad, colorless, and with about fourteen accessory hairs. Fore tarsi unarmed.

Abdomen broad and heavy. Tube equal in length to head and three times as long as basal width, which is more than twice the apical, sides nearly straight. Bristles very long and pointed, yellow, those on segment 9 slightly shorter than tube and slightly longer than terminal bristles.

Measurements of holotype: (♀): Length 1.94 mm.; head, length 0.294 mm., greatest width 0.228 mm., least width (at base) 0.194 mm.; eyes, length 0.087 mm., width 0.063 mm., interval 0.093 mm.; postocular bristles, length 0.120 mm.; prothorax, length 0.142 mm., width (inclusive of coxæ) 0.342 mm.; pterothorax, length 0.360 mm., width 0.396 mm.; abdomen,

greatest width 0.540 mm.; tube, length 0.294 mm., width at base 0.099 mm., at apex 0.046 mm.

Antennal segments:	1	2	3	4	5	6	7	8
Length (μ)	60	72	102	99	84	69	54	45
Width (μ)	50	36	35	37	34	32	24	16

Total length of antenna, 0.585 mm.

Described from one female taken on a window at Nelson, North Queensland, in July, by A. A. Girault.

The long tube, the coloration of the antennæ and wings, and the prominent interocellar bristles readily distinguish this species from its Australian congeners.

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SIX NEW BIRDS FROM CELEBES AND JAVA.

BY J. H. RILEY.[1]

Further study of the collection of birds made in Celebes[2] by Mr. H. C. Raven has revealed the fact that five additional forms from that island and one from Java apparently require names. They may be known from the following descriptions:

Excalfactoria chinensis palmeri, subsp. nov.

Type, adult male, U. S. National Museum, No. 219,195, Daroe, Java, June 20, 1909. Collected by William Palmer (original No. 1000).

Similar to *Excalfactoria chinensis lineata* of the Philippines, but the back and scapulars much mixed with slate color, the wing with much rufous, and the rufous of the breast more extensive. Wing, 72; culmen, 11.5; tarsus, 22; middle-toe, 18 mm.

Remarks.—In a series of twelve males of *Excalfactoria chinensis lineata* from the Philippines, there is no rufous in the wings, except in one and then it is only slight. Two males from Celebes have some rufous in the wing but not to the same extent as Javan birds; their backs resemble the Philippine form. The Celebes bird is very small and apparently represents a recognizable race that Gould[3] named and which will probably stand as *Excalfactoria chinensis minima.* Of the mainland bird I have only one male from the Malay Peninsula. It is like the Philippine form but much lighter in color.

Anas superciliosa percna, subsp. nov.

Type, adult male, U. S. National Museum, No. 250,631, Koelawi, Celebes, Feb. 3, 1917. Collected by H. C. Raven (original No. 3506).

Similar to *Anas superciliosa rogersi* but smaller and averaging darker, especially on the throat. Wing, 250; tail, 98; culmen, 52.5; tarsus, 43 middle-toe, 53 mm.

Remarks.—In addition to the type, there are two males, two females, and a downy young from the type locality taken February 2 and 3; two males and two females from Dolo, December 26; one male from Winatoe, January 21; and one male from Rano Lindoe, March 13.

[1]Published with the permission of the Secretary of the Smithsonian Institution.

[2]Cf. Proc. Biol. Soc. Wash., 31, 1918, pp. 155–160.

[3]P. Z. S., 1859, 128.

This series, while showing quite a little variation, agrees in being darker and smaller than Australian birds; the throats are noticeably of a deeper buff, more pinkish. From *Anas superciliosa pelewensis*, the Celebes bird differs in being larger with the buff of the throat more extensive. Of *Anas superciliosa superciliosa* my series is small and useless for comparison, but as this race is said to be even larger than that from Australia, comparison is not necessary.

Megalurus celebensis, sp. nov.

Type, adult male, U. S. National Museum, No. 252,087, Besoa, Celebes, October 23, 1917. Collected by H. C. Raven (original No. 4551).

Similar to *Megalurus amboinensis* but larger, with the back more heavily streaked with blackish, the cinnamon edges of the tertials broader, the nape obscurely streaked with dusky, the blackish streaks on the wing-coverts broader, the lower back, rump, and upper tail-coverts streaked with brownish black, and the buffy chest band more pronounced. Wing, 67; tail, 113.5; culmen, 12 mm.

Remarks.—Only two specimens were taken at the type locality and on the same day; a male and female. The female is smaller than the male with the streaks on the head extending onto the forehead and the black streaking on the back narrower. A male specimen of *Megalurus amboinensis*, with which the above species has been compared, has no streaks on the nape whatever, the top of the head is a deeper sayal brown, and the lower back and rump are without streaks, only the upper tail-coverts having narrow dark shaft streaks. It measures: wing, 61; culmen, 12 mm.

This genus has not been hitherto recorded from Celebes.

Dicruropsis montana, sp. nov.

Type, adult male, U. S. National Museum, No. 252,150, Besoa, Celebes, October 28, 1917. Collected by H. C. Raven (original No. 4586).

Similar to *Dicruropsis leucops* but much smaller, especially the bill and feet; the metallic colors duller, more bronzy, and spots on the chest reduced in size; the tail more forked, the feathers narrower, and the outer pair less flared outwardly. Wing, 131; tail, 138; culmen, 24; tarsus, 19; middle toe, 14 mm.

Remarks.—The present species is founded upon a male and female from the type locality, a female from Rano Rano, and a female from Goenoeng Lehio. All the above localities are in the mountains, in the general region of Lake Lindoe, which is the unnamed lake on Meyer and Wiglesworth's map[1] to the northwest of Lake Posso.

In this genus there is practically no difference in color between the sexes and very little difference in size; females average slightly smaller. The three females of *Dicruropsis montana* measure as follows: wing, 133.5–140 (137.5); tail, 133–152.5 (142.2); culmen, 24–24.5 (24.3); tarsus, 19.5–20 (19.7); middle toe, 14–14.5 (14.2). Nine females of *Dicruropsis leucops* measure: wing, 154–167 (159.4); tail, 131–150 (138.6); culmen, 29–35.5

[1]Birds Celebes, I, 1898, map. 2.

(32.6); tarsus, 24–26 (24.8); middle toe, 17–19 (18.2). From the above it will be seen how greatly the two above species differ in size; differences that can not be explained in any other way than that the smaller bird is specifically distinct.

Pachycephala pluviosa, sp. nov.

Type, adult male, U. S. National Museum, No. 252,197, Rano Rano, Celebes, December 22, 1917. Collected by H. C. Raven (original No. 4834).

Pileum and auriculars medal bronze, shading into buffy brown on the foreneck; across upper back a band of deep neutral gray; rest of back warbler green, becoming more yellowish on the rump; breast neutral gray, becoming much lighter on the abdomen; under tail-coverts cinnamon; flanks pyrite yellow; wings fuscous-black, the feathers edged outwardly with the color of the back, this edging on the outer primaries very narrow and grayish towards the tips; under wing-coverts and the inner margins of the remiges where they rest against the body, cinnamon; tail above deep neutral gray, the outer feathers fuscous-black on the inner web. Wing, 81.5; tail, 67; culmen, 13; tarsus, 21; middle toe, 13.5 mm.

The female resembles the male, except the pileum is saccardo's olive with a yellowish wash and the chin and throat cinnamon-buff, streaked with deep neutral gray.

Remarks.—The above species is founded upon a good series of both sexes and one immature, all from the type locality. It is evidently similar to *Pachycephala bonthaina* of south Celebes, but the pileum and throat are brown, not greenish yellow-olive. *Pachycephala bonensis* of north Celebes was described from an immature specimen. The immature specimen of *Pachycephala pluviosa* when compared with the plate of *Pachycephala bonensis* in Meyer and Wiglesworth[1] presents a number of differences; the former has the pileum saccardo's olive, the auriculars are like the pileum, there are no cinnamon edgings to the outer primaries, the breast is without a buffy-cinnamon band down the center, and there are other differences.

Zosterops atrifrons surda, subsp. nov.

Type, adult male, U. S. National Museum, No. 251,158, Rano Lindoe Celebes, March 24, 1917. Collected by H. C. Raven (original No. 4045).

Similar to *Zosterops atrifrons* Wallace, but larger, throat duller yellow, the chest grayer, the white eye-ring narrower, the black sub-orbital streak more diffused, and the back more greenish. Wing 57; tail, 39.5; culmen, 11; tarsus, 17; middle toe, 10 mm

Remarks.—The type of *Zosterops atrifrons* Wallace came from Menado. In the present collection there is a good series from north Celebes and also from the north-central mountainous part of the island. These two series when compared are strikingly different to the eye though hard to discriminate in words.

1Birds Celebes, 2, 1898, pl. 18.

Zosterops subatrifrons Meyer and Wiglesworth from Peling Island is described[1] as having the throat clearer yellow and the breast whiter than in *Zosterops atrifrons atrifrons*, while in the present race the reverse is the case.

A series of males of the two forms average as follows:

	Wing.	Tail.	Culmen.
Ten *Zosterops a. atrifrons*	52.8	37.2	10.2
Eight *Zosterops a. surda*	57.2	40.9	11.1

[1]Birds Celebes, 2, 1898, 490.

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THE GENERA CORYTHAICA STÅL AND DOLICHOCYSTA CHAMPION. (TINGIDAE: HETEROPTERA.)

BY EDMUND H. GIBSON.

Much confusion has existed in the identity and relationship of the various species of the two Tingid genera *Corythaica* and *Dolichocysta*. This state of affairs was probably based upon the fact that until recently the known forms of *Corythaica* were macropterous and those of *Dolichocysta* were brachypterous. The writer has examined both long- and short-winged forms of nearly every species of the two genera and is thus able to untangle some of the systematic puzzles of this group.

The two genera are very closely related, but in general may be separated by the facts that *Dolichocysta* is a more compact form and has a distinct bulbous elevation on the elytra. *Corythaica* has a certain degree of delicacy lacking in *Dolichocysta* and is without the distinct bulbous elevation altho a swelling may sometimes be noticeable and also an acute enlargement of the carina separating the subcostal and discoidal areas may be present.

This paper is largely based upon specimens in the U. S. National Museum. In it are described two new species of *Dolichocysta* and one of *Corythaica*. One species, *Corythaica monacha* Stål, is of considerable economic importance, being a decided enemy to eggplants in the West Indies. It is expected that as general collecting increases, especially in Central and South America, many new species will be discovered, but as our study is to-day this paper brings our knowledge up to date.

The detailed shape of the pronotal hood and carinae and their

comparative measurements are not nearly as reliable for diagnostic specific characters as they are in other groups, such as *Corythucha* Stål.

The Genus Corythaica Stål.

Corythaica was described by Stål in 1873 to include his *Tingis monacha* which he had previously described in 1860. The genus now consists of five known species, one of which is herein described as new. Three of the species are known to be of economic importance, feeding upon cultivated plants.

Distributional Groupings of Species.

The following distributional grouping of species may aid in the identification of species:

Eastern United States—*bellula* Bueno.
Western United States—*acuta* Drake.
Southern United States—*carinata* Uhler.
Central America—*carinata* Uhler.
West Indies—*carinata* Uhler, *monacha* Stål.
South America—*monacha* Stål, *costata* Gibson.

Food Plants of the Species.

The only recorded food plants for any of the species may be briefly listed as follows:

Eggplant—*carinata* Uhler, *monacha* Stål. (also on wild eggplant).
Cotton—*costata* Gibson.
Castor Oil—*monacha* Stål.
Bueno reports that he captured *bellula* by sweeping a grassy meadow intermingled with moss.

Corythaica Stål.

1873—Stål, Enum. Hemip., iii, pp. 120, 128.
1897—Champion, Biol. Centr. Am., Heter., ii, p. 9.
1898—Champion, Trans. Ent. Soc. Lond., p. 58.
1893—Uhler, Proc. Zool. Soc. Lond., p. 716 (*Typonotus*).

Comparatively narrow and elongate, especially as compared with *Dolichocysta* Champion. Head moderately long with rostral sulcus closed in front. Antennæ moderately long, first segment stout and longer than second, third segment very long, fourth segment about as long as first two taken together and prominently swollen. Pronotum with a prominent hood, usually narrow, and extending beyond apex of head. Pronotum with three membranous nearly parallel carinae, and lateral membranous margins flaring. Elytra areolate, with areas prominently separated by sharp carinate veins. No bulbous swelling between the discoidal and subcostal areas. Species may be represented by both long- and short-winged forms.

KEY TO THE SPECIES.

1. Lateral margins of pronotum wide and angular ..... 2.
   Lateral margins of pronotum always rounded and usually narrow ..... 4.
2. Costal area of elytra with two rows of areoles at its widest part ..... *monacha* Stål.
   Costal area of elytra with but one row of areoles at its widest part ..... 3.
3. Subcostal area of elytra with but three rows of areoles at its widest part ..... *costata* n. sp.
   Subcostal area of elytra with four or five rows of areoles at its widest part ..... *acuta* Drake.
4. Subcostal area of elytra noticeably wider than discoidal area as viewed from above. Areoles of elytra not clouded, veins very dark ..... *bellula* Bueno.
   Subcostal and discoidal areas about equal in width as viewed from above. Numerous areoles of elytra clouded, veins not so dark ..... *carinata* Uhler.

Corythaica monacha Stål.

1860—Stål, Rio Hem., i, p. 64 (*Tingis monacha*).
1864—Costa, Ann. Mus. Zool., ii, p. 146 (*Tingis cyathicollis*).
1873—Stål, Enum. Hem., iii, p. 128 (*Corythaica monacha*).
1893—Uhler, Proc. Zool. Soc. Lond., p. 716 (*Typonotus planaris*).
1917—Cotton, Jr. Dept. Agric., Porto Rico, 1, No. 3, pp. 170–173.

Pronotal hood curving downward in front of head, evenly narrowed toward apex as viewed from above. The pronotal carinae high with a distinct row of areoles and more or less wavy. Median carina higher and longer than hood. Membranous margins of pronotum distinctly angular and reflexed anteriorly, flaring and wide. Elytra entirely areolate, numerous areoles being clouded. Costal area with two rows of areoles at its widest part, subcostal with two or three, and discoidal with three. Body beneath brown. Legs light yellowish brown. General appearance light. Intensity of color varies greatly. Only long-winged forms are known to the writer.

Uhler's type specimen of *Typonotus planaris* is in the collection of the U. S. National Museum. Numerous specimens from St. Vincent Island, Porto Rico, and Grenada have been examined. Labels on various specimens indicate that they have been collected from *Solanum torvum*, *Solanum melongena*, and *Ricinus communis*.

The biology of this lace-bug is treated by Mr. R. T. Cotton in the Journal of the Dept. of Agriculture of Porto Rico, for July, 1917.

Corythaica costata, n. sp.

Pronotal hood comparatively wide at base. Median carina high, lateral carinae widening anteriorly, otherwise parallel. Membranous margins of pronotum appearing angular as viewed from above, wide. Costal area of

elytra with one row of areoles, subcostal with three, and discoidal four at its widest part. General color of insect light brown, no definite color markings, elytra more or less mottled with darker brown. Antennae and legs light yellowish brown, unicolorous. Body dark beneath. Length 2.6 mm. male.

Type ♂, Santa Clara, Peru. Collected from cotton by Mr. C. H. T. Townsend. Paratype ♀, same data as type. Both in the collection of the U. S. National Museum. Type No. 22,291.

Corythaica acuta Drake.

1917—Drake, Ohio Jr. Science, xviii, No. 6, p. 214 (*Dolichocysta*).

Pronotal hood comparatively broad at base with areoles smaller than in *costata*. Carinae, wavy and nearly of the same height. Membranous margins angular as viewed from above, because of the anterior portion being reflexed. Elytra with one row of areoles in costal area and subcostal area with four or five rows at its widest part, Discoidal area narrower than subcostal and long. Membranous portions white, somewhat mottled but not as much so as in *costata*. Antennae and legs concolorous and darker than membranous portions altho of a light yellowish brown. Body dark beneath.

Drake gives its distribution as Colorado and Montana. A paratype from Colorado is in the Collection of the U. S. National Museum.

Drake describes this as a new species of the genus *Dolichocysta* Champ. As it lacks the bulbous elevation on the elytra and is of the narrow type the writer considers it properly transferred to *Corythaica*.

Corythaica bellula Bueno.

1917—Bueno, Bull. Brooklyn Ent. Soc., xii, p. 19.

Pronotal hood evenly conical as viewed from above and more acute than in other species, areoles very prominent. Carinae straight, not wavy, lateral carinae fartherest apart at the middle. Lateral membranous margins biseriate, narrow and rounding. Pronotum a chestnut brown, membranous portions light with veins of the hood much darkened, median vein nearly black.

Elytra with a single row of areoles in costal area, five rows in subcostal, and three rows in discoidal area. Veins much darkened, some appearing black. Antennae and legs concolorous, yellowish. Insect chestnut brown beneath.

The only locality from which this species has been collected is White Plains, N. Y. Several specimens are in the collection of the U. S. National Museum.

Corythaica carinata Uhler.

1894—Uhler, Proc. Zool. Soc. Lond., p. 203.
1901—Champion, Biol. Centr. Amer., ii, p. 9.

Pronotal hood long extending for one-half its length beyond the eyes as

viewed from above, raised anteriorly. Lateral membranous margins biseriate, rounding and narrow. Carinae nearly parallel, the median one much higher than the lateral ones. Elytra with one row of areoles in costal area, subcostal and discoidal each with three rows. Veins of elytra dark, giving the insect a generally dark appearance. Areoles at apex of elytra clouded with brown also the second areole of costal area in front clouded apical areoles darkened. Also two areoles clouded in costal area opposite apex of pronotum. Legs and antennae concolorous, yellowish brown. Insect chestnut brown beneath.

Several specimens in U. S. National Museum from the West Indies; one specimen from Texas. The species is also known to occur in Central America.

One specimen bears the food plant label of eggplant.

The Genus Dolichocysta Champion.

Dolichocysta was described by Champion in 1898 for his *venusta*, which is the type of the genus. The genus now consists of four species, two of which are herein described as new and one, *constricta* Osb. and Drake, is transferred from the genus *Corythaica* within which genus it was originally described. Practically nothing is known of the economic importance of any of the species.

The distribution of the species may be listed as follows:
Central Western United States—*constricta* Osb. & Dr., *magna* Gibson.
South Western United States—*venusta* Champ.
Southern United States—*densata* Gibson.

Dolichocysta Champion.

1898—Champion, Trans. Ent. Soc. Lond., p. 56.
1917—Drake, Ohio Jr. Science, xvii, No. 6, p. 214.

Closely related to *Corythaica*. In general form more compact. Head moderately long with rostral sulcus closed in front. Antennae moderately long, first segment stout and longer than the second, third very long, fourth about as long as first two taken together and prominently swollen. Pronotum with a large hood, long, extending beyond the head, and three membranous nearly parallel carinae. Lateral margins of pronotum flaring, membranous. Elytra with a prominent bulbous elevation near the middle, along the carinae which separates the subcostal and costal areas. Species may be represented by both long- and short-winged forms.

Key to the Species.

1. Costal area of elytra with one row of areoles..... *constricta* Osb. & Dr.
   Costal area of elytra with at least two rows of areoles..... 2.
2. Elevation on elytra appearing as tho flattened as viewed from above..... *venusta* Champ.
   Elevation on elytra not appearing flattened, acute or well rounded.... 3.

3. Elevation on elytra large, in length at least one-third of discoidal area. Areoles in hood small.....*magna* n. sp.
Elevation on elytra smaller, not so long as one-third the length of discoidal area. Areoles on hood comparatively larger.....*densata* n. sp.

Dolichocysta venusta Champion.

1898—Champion, Trans. Ent. Soc. Lond., p. 57.
1917—Drake, Ohio Jr. Science, xvii, No. 6, p. 214.
1917—Van Duzee, Cat. Hemiptera of N. A. etc., p. 215.

Pronotal hood large and broad, especially at base, apex blunt as viewed from above. Carinae wavy, membranous margins wide, flaring and rounded. Antennae only moderately long. Posterior pronotal process with large areoles, pronotum finely punctate before. Elytra with a prominent bulbous elevation along each carina which separates the subcostal and discoidal areas. This elevation is evenly rounded and as viewed from above appears somewhat flattened. Costal area with heavy veins which are irregularly branched, making two irregular rows of areoles. Subcostal and discoidal areas with about six rows of areoles.

General appearance of insect dark, veins of membranous portions irregularly darkened giving a mottled appearance as viewed from above. Antennae and legs yellowish brown. Last segment of antennae much darkened. The first two segments of antennae and femur of legs chestnut brown. Tibiae yellowish brown. Beneath the insect is chestnut brown to black.

The specimens examined are all from Los Angeles, California. It is also recorded from Lower California and Colorado.

Practically nothing is known of its food plants.

Dolichocysta magna, n. sp.

Pronotal hood not as broad as in *venusta* Champ. Carinae wavy, membranous margins wide, flaring and rounded. Elytra with a prominent bulbous elevation but which is not so large or rounding as in *venusta*. As viewed from above it is more narrow and acutely rounded above, not at all flattened. Costal area regularly biseriate, subcostal and discoidal areas with about six rows of areoles.

General appearance resembles *venusta*. Legs somewhat darker.

Type ♂, Fort Collins, Colorado; allotype ♀, Hill City, South Dakota; paratype ♀, Nebraska. All in the collection of the U. S. National Museum. Type No. 22,293.

Dolichocysta densata, n. sp.

Closely resembles the preceding species, from which it differs only in the wider and more evenly rounded membranous margins of the pronotum, the larger and higher elevation on the elytra, and the two irregular rows of areoles in the costal area of the elytra.

Type, ♀ allotype ♂, two paratypes ♀, all from San Diego, Texas, and in the collection of the U. S. National Museum. Type No. 22,294.

Densata is a manuscript name of Uhler.

Dolichocysta constricta Osb. & Drake.

1917—Osborn and Drake, Ohio Jr. Science, xvii, No. 8, p. 304.
1917—Van Duzee, Cat. Hemiptera, p. 817.

The following description is taken from part of the original by Drake. The species was described from a single specimen from Colorado which the writer has not seen, but according to Drake's description it is plain that it belongs in this genus.

"Hood elongate, a little more arched and narrowed anteriorly than in *Corythaica carinata* Uhl. Pronotum closely punctate . . . median carina more strongly raised anteriorly, with one complete row of areoles and three or four extra cells at the highest part. . . . Pronotal margins biseriate, strongly reflexed. . . . Elytra reaching considerably beyond abdomen, broader and more strongly constricted just back of the middle than in *C. carinata*, the tumid elevation moderately large; costal area uniseriate, . . . subcostal area mostly triseriate; discoidal area not quite reaching the middle of the elytra with four rows of cells at the widest part; sutural area broad. Length 2.62 mm.; width 1 mm.

Color: General color grayish, with fuscous markings. Body beneath brownish, the thorax darker brown. Legs brownish, the tips of tarsi infuscated. Antennae brownish. Pronotum brownish. Elytra grayish-brown, with a transverse costal band in front of constriction, another near apex, and a few apical spots fuscous."

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DESCRIPTIONS OF NINE NEW NORTH AMERICAN PIKAS.

BY ARTHUR H. HOWELL.

Study of the North American pikas of the genus *Ochotona* has resulted in the discovery of a number of new forms, nine of which are here named in advance of a revision of the group now in preparation.

Ochotona princeps lutescens, subsp. nov.

Type.—No. 108,650, U. S. National Museum, Biological Survey collection; adult♂, skin and skull; from Mt. Inglesmaldie, near Banff, Alberta; collected July 26, 1899, by G. F. Dippie; original number 193 (2973, "X" catalogue).

Subspecific characters.—Similar to *princeps*, but smaller; coloration decidely paler, both above and below.

Color.—*Type* (acquiring summer pelage): Upperparts mixed pinkish buff and fuscous, darkest in the middle of the back, shading to clear pinkish buff along sides; hinder back (in worn winter pelage) smoke gray, blotched with pinkish buff and fuscous; ears hair-brown, broadly margined with light buff and clothed inside with buffy white hairs; feet creamy white, faintly washed with pinkish buff; soles drab; palms pale olive-buff; underparts creamy white, faintly washed with pale pinkish buff, chiefly along median line.

Skull.—Averaging decidedly smaller than that of *princeps*, with shorter nasals.

Measurements.—Average of 8 adults (4 males, 4 females) from Canmore, Alberta: Total length, 177 (170–188); hind foot, 29.4 (26–31). *Skull* (of type, adult male): Occipito-nasal length, 43.3; zygomatic breadth, 21.6; breadth of cranium, 18; interorbital breadth, 5.3; width of palatal bridge, 2; length of nasals, 13.9.

Remarks.—This race is a strongly characterized form occupying, apparently, the ranges in southern Alberta lying to the eastward of the main divide of the Rocky Mountains. A considerable series has been examined from the vicinity of Banff, and a few from Mt. Forget-me-not, Alberta.

Ochotona uinta ventorum, subsp. nov.

Type.—No. 176,778, U. S. National Museum, Biological Survey collection; ♂ adult, skin and skull; from Fremont Peak, Wind River Mountains, Wyoming; collected July 19, 1911, by H. E. Anthony; original number 395.

Subspecific characters.—Size of *uinta;* color in winter pelage paler and more grayish (less buffy); hind feet paler; summer pelage less intensely buffy, both dorsally and ventrally. Compared with *princeps:* Size larger; color in both pelages paler (less blackish).

Color.—Type (acquiring summer pelage): Head, shoulders, and fore back cinnamon-buff, strongly washed with fuscous-black; sides and hinder back (in worn winter pelage) smoke gray, faintly washed with pinkish buff; ears chaetura drab, margined with buffy white; feet pale pinkish buff; soles hair-brown; palms soiled buffy white; underparts soiled whitish, faintly washed with light buff. *Winter pelage* (specimen from Jackson, Wyoming, September 19): General tone of upperparts between drab and wood brown, shading on sides to light pinkish cinnamon; front of face washed with clay color; head and back washed with fuscous; rump blotched with blackish; underparts soiled white, faintly washed with pinkish buff; ears deep mouse gray; feet pinkish buff.

Skull.—Closely similar to that of *uinta;* larger than that of *princeps,* with longer nasals.

Measurements.—Type (adult ♂): Total length, 186; hind foot, 31. *Skull:* Occipito-nasal length, 44; zygomatic breadth, 21.5; breadth of cranium 17.8; interorbital breadth, 4.6; width of palatal bridge, 2; length of nasals, 15.

Remarks.—This race occupies the Wind River, Gros Ventre, Absaroka, and Teton Ranges in northwestern Wyoming and the Beartooth Mountains in southwestern Montana. It is closely related to *uinta,* as shown by the skull; the coloration in all pelages is more grayish and less buffy, this difference being most strikingly shown in the worn winter pelage of June or July specimens.

Ochotona uinta lemhi, subsp. nov.

Type.—No. $\frac{23548}{3095}$, U. S. National Museum, Biological Survey collection; ♀ adult, skin and skull; from Lemhi Mountains, 10 miles west of Junction, Idaho; collected August 19, 1890, by Clark P. Streator; original number 174.

Subspecific characters.—Size small (much smaller than *ventorum;* slightly smaller than *princeps);* color in summer pelage similar to *ventorum* but paler; much paler than *princeps;* in winter pelage nearest to *princeps,* but paler and more grayish.

Color.—Type (acquiring summer pelage): Head, shoulders, and fore back cinnamon buff, washed with fuscous; hinder back (retaining worn winter pelage) smoke gray, washed with fuscous; sides grayish white, washed with pinkish buff; feet pinkish buff, the soles hair-brown; ears externally chaetura black, internally fuscous, with light buff hairs, the margins light buff; underparts soiled whitish, moderately washed with pinkish buff.

Skull.—Similar to that of *ventorum,* but shorter and relatively broader;

averaging slightly smaller than that of *princeps*, the nasals narrower posteriorly.

Measurements.—Type (adult ♀): Total length, 180; hind foot, 28. *Skull:* Occipito-nasal length, 41.3; zygomatic breadth, 20.4; breadth of cranium, 17; interorbital breadth, 4.8; width of palatal bridge, 2.1; length of nasals, 14.3.

Remarks.—The Lemhi pika is most nearly related to *ventorum*, with which it intergrades in southwestern Montana (Emigrant Peak, Park County). A large series is available from the type locality, and smaller series from Little Lost River Mountains, Ketchum, Stanley Lake, the head of Wood River, and mountains east of Birch Creek, Idaho.

Ochotona uinta nevadensis, subsp. nov.

Type.—No. 94,213, U. S. National Museum, Biological Survey collection; adult female, skin and skull; from Ruby Mountains, southwest of Ruby Valley P. O., Nevada, altitude 10,500 feet; collected June 21, 1898, by Vernon Bailey; original number 6580.

Subspecific characters.—Similar in worn winter pelage to *uinta*, but distinctly paler, and sides of nose and face more extensively grayish. Compared with *cinnamomea:* Color very much paler; skull larger, with much broader palatal bridge and longer nasals. Compared with *lemhi:* Size smaller; skull flatter; nasals broader posteriorly.[1]

Color.—Type (in worn winter pelage): Upperparts mixed pinkish buff and fuscous, darkest in the median line and on front of face; sides of nose and face smoke gray; ears fuscous, margined with light buff; sides pinkish buff; feet pale pinkish buff; soles drab; palms soiled buffy white; underparts grayish white, moderately washed with pinkish buff.

Skull.—Closely similar to that of *uinta*, with long, wide nasals and broad palatal bridge.

Measurements.—Type (adult female): Total length, 200; hind foot, 32; occipito-nasal length, 44.1; zygomatic breadth, 21.2; breadth of cranium, 18; interorbital breadth, 5.2; width of palatal bridge, 2.8; length of nasals, 14.5.

Remarks.—The Ruby Mountains pika, as shown by its skull characters, is most nearly related to *uinta* of the high mountains of eastern Utah, the ranges of the two forms being separated by the Great Salt Lake Desert. It is widely different from *cinnamomea* of the Beaver Mountains, the latter being in the *schisticeps* group. At present the new form is known only from two adults and one young specimen in worn winter pelage; additional material in fresh summer or fall pelage is needed before a complete description can be prepared.

Ochotona saxatilis incana, subsp. nov.

Type.—No. 128,914, U. S. National Museum, Biological Survey collection; ♀ adult, skin and skull; from Pecos Baldy, New Mexico, altitude 12,000 feet; collected August 10, 1903, by Vernon Bailey; original number 8079.

[1]Color differences not definable, through lack of comparable material.

Subspecific characters.—Similar in size and coloration to *O. saxatilis saxatilis*, but general tone of upperparts in summer pelage paler and less tawny; in winter pelage more grayish and less ochraceous. Compared with *nigrescens:* Upperparts paler and more buffy.

Color.—Type (acquiring summer pelage): General tone of upperparts between cinnamon-buff and pinkish buff, moderately washed with fuscous or fuscous-black; sides cinnamon-buff, shading posteriorly to pinkish buff; rump (in worn winter pelage) smoke gray; ears chaetura black, margined with buffy white and blotched on inner surface with the same color; feet pinkish buff, washed with cinnamon-buff; soles chaetura drab; palms soiled whitish, tinged with drab; underparts soiled whitish, washed with pinkish buff.

Skull.—Closely similar to that of *saxatilis*, but nasals averaging slightly shorter.

Measurements.—Type (adult ♀): Total length, 202; hind foot, 33. *Skull:* Occipito-nasal length, 46.8; zygomatic breadth, 22.5; breadth of cranium, 19; interorbital breadth, 5.3; width of palatal bridge, 2.5; length of nasals, 15.8.

Remarks.—This form is closely related to *saxatilis*, of the Colorado Mountains, but is widely different from *nigrescens* of the Jemez Mountains, New Mexico. Its range includes the Pecos River, Taos, and Culebra Ranges in northern New Mexico, extending, probably, into Colorado as far as Sierra Blanca.

Ochotona fenisex brunnescens, subsp. nov.

Type.—No. 227,259, U. S. National Museum, Biological Survey collection; ♂ subadult, skin and skull; from Keechelus, Washington; collected August 23, 1917, by George G. Cantwell; original number, 38 (19568, "X" catalogue).

Subspecific characters.—Similar (in winter pelage) to *fenisex*,[1] but upperparts decidedly browner (less grayish) and underparts more buffy.

Color.—Type (in fresh pelage, August 23): Upperparts mixed cinnamon and fuscous, the general tone near snuff brown; sides deep pinkish cinnamon, shading to light pinkish cinnamon; ears chaetura black, margined with buffy white; feet soiled whitish, washed with light pinkish cinnamon; soles chaetura black; palms hair-brown; underparts light pinkish cinnamon.

Skull.—Similar to that of *fenisex* but averaging larger, with relatively shorter nasals.

Measurements.—Type (subadult ♂): Total length 200; hind foot, 33. *Skull:* Occipito-nasal length, 42.9; zygomatic breadth, 22.1; breadth of cranium, 18.4; interorbital breadth, 5.6; width of palatal bridge, 2.6; length of nasals, 14.1.

Remarks.—The Cascade pika is a strongly marked race, and has an extensive range on the high Cascades, from the vicinity of Chilliwack in

[1] As distinguished by specimens from near Okanagan, British Columbia, and Horseshoe Basin, near Mt. Chopaka, Washington.

southwestern British Columbia south to Crater Lake, Oregon. It has been identified by most recent writers[1] with *Lagomys minimus* Lord (= *Ochotona fenisex* Osgood), but material now in hand indicates that the latter is a paler animal, occupying the interior ranges to the eastward of the main Cascade Range.

Ochotona fenisex fumosa, subsp. nov.

Type.—No. 91,144, U. S. National Museum, Biological Survey collection; ♂ adult, skin and skull; from Permilia Lake, west base Mt. Jefferson, Oregon; collected October 4, 1897, by J. Alden Loring; original number 4799.

Subspecific characters.—Similar to *O. fenisex brunnescens,* but coloration darker, with much black on dorsal surface in fresh winter pelage.

Color.—*Type* (in winter pelage): Upperparts a mixture of vinaceous-cinnamon and black, the median dorsal area nearly solid black, shading on sides to nearly clear vinaceous-cinnamon; sides of nose dark smoke gray and top of head shaded with the same; sides of neck, beneath ears, washed with cinnamon-buff; ears chaetura black, edged with buffy white; feet cinnamon-buff; soles chaetura drab; palms hair-brown; underparts soiled whitish, strongly washed along middle of belly with vinaceous-cinnamon, shading on throat to pinkish cinnamon. *Summer pelage* (specimen from Three Sisters, Oregon, July 15): Similar to the winter pelage, but upperparts less blackish, less buffy, and more strongly shaded with grayish.

Skull.—Similar to that of *brunnescens,* but averaging slightly narrower; posterior border of palate with a very small spine in the middle of the post-palatal notch.

Measurements.—*Type* (♂ adult): Total length, 202; hind foot, 33. *Skull:* Occipito-nasal length, 44.5; zygomatic breadth, 21.3; breadth of cranium, 18.2; interorbital breadth, 5.3; width of palatal bridge, 2.4; length of nasals, 15.4.

Remarks.—This is a very dark form, occupying the western slopes of the Cascade Range in Oregon. It is known at present from the west slope of Mt. Jefferson, Three Sisters, Mackenzie Bridge, and Clackamas River, 15 miles above Estacada.

Ochotona schisticeps jewetti,[2] subsp. nov.

Type.—No. 208,352, U. S. National Museum, Biological Survey collection; adult ♂, skin and skull; from head of Pine Creek, near Cornucopia, south slope Wallowa Mts., Baker County, Oregon; collected September 3, 1915, by Stanley G. Jewett; original number 2362.

Subspecific characters.—Nearest to *O. schisticeps schisticeps,* but paler in summer pelage, and slightly darker in winter pelage; decidedly darker than *O. schisticeps muiri,* in both summer and winter; paler (less blackish) than *O. s. taylori* in both pelages.

[1] See especially, Bangs, Proc. New England Zool. Club, I, p. 39, 1899.

[2] Named for Mr. Stanley G. Jewett in recognition of his excellent field work on Oregon mammals.

Color.—Type (summer pelage): Upperparts light pinkish cinnamon, mixed with fuscous; sides of nose pale smoke gray; sides of face, occiput, and nape washed with the same; ears chaetura drab, margined with grayish white and faintly washed with the same inside; sides light pinkish cinnamon; feet grayish white, washed with light pinkish cinnamon; soles chaetura drab; palms grayish white, washed with drab; underparts grayish white, washed with light pinkish cinnamon. *Winter pelage:* Closely similar to *schisticeps* in the corresponding pelage, but slightly darker.

Skull.—Closely similar to that of *schisticeps.*

Measurements.—Average of 12 adults (6 males, 6 females) from type region: Total length, 182 (165–195); hind foot, 31 (30–32). *Skull.—Type* (♂ adult): Occipito-nasal length, 42.6; zygomatic breadth, 21.6; breadth of cranium, 19; interorbital breadth, 5.2; width of palatal bridge, 1.5; length of nasals, 13.7.

Remarks.—The pika of the Blue Mountains is most nearly related to *O. schisticeps schisticeps* of the high Sierra Nevada; its range, however, is separated from that of *schisticeps* by the intervening lava bed region, occupied by *O. schisticeps taylori.*

Ochotona schisticeps fuscipes, subsp. nov.

Type.—No. 158,094, U. S. National Museum, Biological Survey collection; ♂ adult, skin and skull; from Brian Head, Parawan Mts., Utah; Collected September 7, 1908, by Wilfred H. Osgood; original number 3475.

Subspecific characters.—Similar to *O. cinnamomea* but larger, with larger and relatively broader skull; coloration above more blackish and less intensely cinnamon; very similar to *O. schisticeps taylori,* but general tone pinkish cinnamon, rather than vinaceous cinnamon; head paler and more grayish; underparts paler.

Color.—Type (summer pelage): Upperparts mixed light pinkish cinnamon and fuscous-black (the blackish prevailing); tip of nose fuscous-black; sides of nose and face smoke gray, tinged with buff and washed with fuscous; back of head and nape washed with pale neutral gray; ears fuscous-black, margined with buffy white; sides pinkish cinnamon mixed with fuscous, becoming clear pinkish cinnamon along line of belly; hind feet soiled whitish, washed with pale cinnamon-buff, the soles fuscous; front feet cinnamon-buff, the palms hair-brown; underparts grayish white, heavily washed with pinkish cinnamon.

Skull.—Similar to that of *cinnamomea,* but larger and relatively broader, with larger audital bullae.

Measurements.—Type (adult ♂): Total length, 195; hind foot, 30.5; average of 4 adult females: 201; 30.2. *Skull* (of type): Occipito-nasal length, 41.7; zygomatic breadth, 21.4; interorbital breadth, 5; width of palatal bridge, 1.4; length of nasals, 12.3.

Remarks.—This race, at present known only from the Parawan Range, is based on a series of 5 adults and one young in summer pelage. Although occupying a range of mountains practically continuous with the Beaver Range—the home of *O. cinnamomea*—the present form is apparently much more closely related to *schisticeps* of the northern high Sierra and to *taylori* of southern Oregon that it is to *cinnamomea.* Its range is separated, however, from the ranges of these forms by a broad expanse of desert.

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PROCEEDINGS
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A NEW CHEILANTHES FROM MEXICO.[1]

BY WILLIAM R. MAXON.

In distinguishing recently[2] the characters separating *Cheilanthes tomentosa* Link and *C. Eatoni* Baker, whose ranges overlap in the territory from Oklahoma to the Mexican border region of New Mexico and Arizona, the following apparently undescribed Mexican species was detected:

Cheilanthes castanea Maxon, sp. nov.

Rhizome short-creeping, nodose or short-branching, the divisions 1 to 3 cm. long, less than 1 cm. thick, densely paleaceous, the scales oblique, imbricate, falcate, 3 to 3.5 mm. long, about 0.6 mm. broad at the base, subulate-attenuate, rather lax, tawny, with a distinct glossy, dark brown, sclerotic, median stripe extending nearly to the filiform, flexuous tip. Fronds few, very closely distichous, erect, 16 to 30 cm. long; stipe 9 to 18 cm. long, castaneous, sublustrous beneath a thin covering of appressed to rigidly ascending, pale tawny scales, the larger of these linear-attenuate, underlaid by minute acicular ones; lamina linear to linear-oblong, long-acuminate, 7 to 17 cm. long, 2 to 4 cm. broad, tripinnate, the rachis similar to the stipe but with larger and more numerous scales; larger pinnae 8 to 12 pairs, spreading (or with age oblique and involute), distant, sessile, deltoid-oblong, acutish, slightly inequilateral; secondary rachises persistently paleaceous, the scales rather large, flaccid, imbricate, linear-deltoid to ovate, long-acuminate, firmly attached at the cordate base, erose-denticulate, tawny; segments of the larger pinnules mostly 3 or 5, oblong, entire, unequal, the terminal ones the longest (up to 4 mm. long), with a cuneate base; segments loosely but copiously tomentose beneath with spirally crispate, light castaneous hairs, glabrate above, the few similar but griseous hairs easily deciduous; segments mostly fertile, the recurved margin gradually thinner, slightly repand, minutely sinuate, pale, hardly forming a proper indusium; sporangia not concealed at maturity, the tomentum separating evenly from the indusiiform margin. Leaf tissue rather rigidly herbaceous, dull grayish green.

[1] Published with the permission of the Secretary of the Smithsonian Institution.
[2] Amer. Fern Journ. 9: 3, 4. 1919.

Type in the U. S. National Herbarium, No. 827,224, collected in the mountains 12 to 14 leagues south of Saltillo, State of Coahuila, Mexico, March 22 to 30, 1880, by Edward Palmer (No. 1390). A second specimen of the same collection is mounted on sheet No. 41,934.

Determined by Eaton[1] as *Cheilanthes gracillima*, a species described from the Cascade Mountains, Oregon, and ranging from Vancouver Island to western Montana, southward in the mountains to Nevada and the Yosemite region, California. Notwithstanding its much greater size, it resembles *C. gracillima* considerably in outline and subdivision of the lamina; but in minute characters that species is very different, for example, in the presence of minute, deciduous, stellate scales (rather than hairs) upon the upper surface of the segments, and in the scaly vestiture of the rachises, the scales being much narrower and copiously long-ciliate (rather than erose-denticulate). The relationship of *C. castanea* is apparently with *C. Eatoni*, from which species it differs sufficiently in its fewer and several times larger segments, these glabrate above and separate, not closely enveloped and held together by a mass of entangled hairs arising from both surfaces, as in *C. Eatoni*. The scales of the rachises are quite different in character also.

Pringle's 11,277, from Hidalgo, is apparently the same plant in a less mature condition. It was distributed as *C. gracillima*.

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[1]Proc. Amer. Acad. **18**: 186. 1883.

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PROCEEDINGS

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DESCRIPTIONS OF APPARENTLY NEW COLOMBIAN BIRDS.

BY W. E. CLYDE TODD.

In this paper, the seventh of the series to appear in these Proceedings, nineteen forms believed to be new are characterized, all from Colombia, and all (with one exception) based on material received in the last few years from Mr. M. A. Carriker, Jr., who has been collecting in the interests of the Carnegie Museum. All measurements are in millimeters, and the names of colors are from Mr. Robert Ridgway's "Color Standards and Color Nomenclature." The author's acknowledgments are due to Mr. Waldron DeWitt Miller and Mr. Harry C. Oberholser for their advice and assistance in deciding the status of certain of these forms.

Atlapetes semirufus majusculus, subsp. nov.

Similar to *Atlapetes semirufus semirufus* (Boissonneau) of the Bogota region of Colombia, but averaging slightly larger and much paler throughout; the throat tinged with yellowish; the back, wing- and tail-edgings, and flanks lighter olive green; and the breast and sides paler, aniline yellow instead of raw sienna. Wing (type), 78; tail, 81; exposed culmen, 13.5; tarsus, 27.

Type, No. 59,763, Collection Carnegie Museum, adult female; Peña Blanca, Santander, Colombia, March 6, 1917; M. A. Carriker, Jr.

Phœnicothraupis rubica coccinea, subsp. nov.

Nearest apparently to *Phœnicothraupis rubica amabilis* von Berlepsch, but adult male brighter and more uniform red below, the sides and flanks less grayish; adult female with the under parts deeper and more uniform buffy brown.

Type, No. 60,728, Collection Carnegie Museum, adult male; La Colorado, Boyaca, Colombia, April 29, 1917; M. A. Carriker, Jr.

Cistothorus æquatorialis fulvescens, subsp. nov.

Similar to *Cistothorus æquatorialis æquatorialis* Lawrence of Ecuador and the Central Andes of Colombia, but decidedly more rufescent throughout, the general tone of the upper parts nearer light Brussels brown than deep tawny olive; and the under parts more strongly shaded with cinnamon buffy, with little or no white medially.

Type, No. 58,258, Collection Carnegie Museum, adult male; Paramo Guerrero, Santander, Colombia, October 13, 1916; M. A. Carriker, Jr.

Leucolepis lawrencii assimilis, subsp. nov.

Similar to *Leucolepis lawrencii lawrencii* (Sclater), but generally paler; upper parts nearer raw umber than mummy brown; and lower breast and abdomen decidedly more grayish, less brownish.

Type, No. 63,860, Collection Carnegie Museum, adult female; Sautata, Rio Atrato, Colombia, January 22, 1918; M. A. Carriker, Jr.

Leucolepis phæocephalus propinquus, subsp. nov.

Decidedly paler in general coloration than *Leucolepis phæocephalus phæocephalus* (Sclater), the upper parts Prout's brown instead of deep chestnut brown, and the under parts correspondingly paler also, with the throat in more decided contrast with the rest of the under surface.

Antioquia specimens, representing *Cyphorhinus brunnescens* Sharpe, while tending slightly towards the characters of this pale northern race, are obviously referable to the typical form, described from Ecuador.

Type, No. 52,813, Collection Carnegie Museum, adult (male?); Jaraquiel, Bolivar, Colombia, March 7, 1916; M. A. Carriker, Jr.

Mecocerculus leucophrys notatus, subsp. nov.

Similar to *Mecocerculus leucophrys setophagoides* (Bonaparte), but more richly colored above, the upper parts much darker and more sooty olive; and the wing-bars and external margins of the secondaries ochraceous buff instead of buffy white.

Type, No. 70,509, Collection Carnegie Museum, adult male; Leonera (near Caldas), Colombia, September 6, 1918; M. A. Carriker, Jr.

Platytriccus albogularis neglectus, subsp. nov.

Similar in general to *Platytriccus albogularis albogularis* (Sclater), of Ecuador and western Colombia, but decidedly duller and paler throughout; the upper parts, sides of the pileum, etc., paler, more olivaceous; the under parts with much less buffy and brownish suffusion.

Type, No. 60,680, Collection Carnegie Museum, adult male; La Colorado, Boyaca, Colombia, April 28, 1917; M. A. Carriker, Jr.

Myiobius semiflavus, sp. nov.

Above plain olive green, the pileum with a partially concealed median patch of empire yellow, the rump and upper tail-coverts pale lemon yellow; wings dusky,the remiges margined externally with buffy citrine, most con-

spicuous basally; tail dull black; beneath pale lemon yellow, the throat still paler (martius yellow), the breast and sides shaded with pyrite yellow or yellowish citrine. Wing (type), 68; tail, 59; exposed culmen, 13; tarsus, 17.

Type, No. 58,638, Collection Carnegie Museum, adult male; El Tambor, Santander, Colombia, November 23, 1916; M. A. Carriker, Jr.

Pipra erythrocephala flammiceps, subsp. nov.

Similar to *Pipra erythrocephala erythrocephala* (Linnæus), but averaging smaller, and pileum, hindneck, and sides of head and neck much brighter and more reddish orange (orange chrome). Wing (type), 54; tail, 17; exposed culmen, 8.5; tarsus, 13.5.

Type, No. 58,777, Collection Carnegie Museum, adult male; El Tambor, Santander, Colombia, November 29, 1916; M. A. Carriker, Jr.

Pipra velutina minuscula, subsp. nov.

Similar to *Pipra velutina velutina* von Berlepsch of Panama and Costa Rica, but constantly smaller, and adult male decidedly blacker throughout. Wing (type), 56; tail, 25; exposed culmen, 6.5; tarsus, 12.5.

Type, No. 64,604, Collection Carnegie Museum, adult male; Quibdo, Rio Atrato, Colombia, March 19, 1918; M. A. Carriker, Jr.

Hylopezus perspicillatus pallidior, subsp. nov.

Similar to *Hylopezus perspicillatus perspicillatus* (Lawrence), but decidedly paler in general coloration; the wing-markings, sides of head, etc., paler buffy; the pileum paler, duller gray; and the back lighter olive green.

Type, No. 59,199, Collection Carnegie Museum, adult male; El Tambor, Santander, Colombia, December 29, 1916; M. A. Carriker, Jr.

Grallaria alticola, sp. nov.

Above, including pileum, deep sepia brown, brightening into Dresden brown on the upper tail coverts; wings externally and tail like the back, the primaries usually somewhat paler; lores and sides of head dull buffy, the auriculars shaded with dusky; throat buffy white, deepening posteriorly and laterally into antimony yellow; rest of under surface buffy ochraceous, indistinctly mottled with whitish tips to the feathers; under wing-coverts bright ochraceous tawny. Wing (type), 93; tail, 50; exposed culmen, 21; tarsus, 46.

Type, No. 59,904, Collection Carnegie Museum, adult male; Lagunillas, Boyaca, Colombia, March 17, 1917; M. A. Carriker, Jr.

Leptasthenura andicola exterior, subsp. nov.

Similar to *Leptasthenura andicola extima* Todd of the Santa Marta region of Colombia, which it moreover resembles in having the wings externally extensively rufescent, but pileum more rufescent, being in fact amber brown, streaked with black, and under parts in general paler and

less distinctly streaked. Easily distinguished from *L. a. andicola* Sclater and *L. a. certhia* von Madarasz by the coloration of the pileum and wings.

Type, No. 59,797, Collection Carnegie Museum, adult male; Lagunillas, Boyaca, Colombia, March 13, 1917; M. A. Carriker, Jr.

Deconychura typica minor, subsp. nov.

Similar to *Deconychura typica typica* Cherrie, but somewhat smaller; upper parts more olivaceous, less rufescent, and buffy markings of under parts paler and more restricted. Wing (type), 92; tail, 89; exposed culmen, 22; tarsus, 19.

Type, No. 59,022, Collection Carnegie Museum, adult male; El Tambor, Santander, Colombia, December 11, 1916; M. A. Carriker, Jr.

Celeus innotatus degener, subsp. nov.

Similar to *Celeus innotatus innotatus* Todd, but averaging smaller, slightly paler above, and paler and rather more heavily marked below; the abdomen much paler, warm buff, contrasting with the breast. Wing (type), 114; tail, 60; exposed culmen, 21; tarsus, 18.5.

Type, No. 59,024, Collection Carnegie Museum, adult male; El Tambor, Santander, Colombia, December 11, 1916; M. A. Carriker, Jr.

Veniliornis chocoensis, sp. nov.

Nearest apparently to *Veniliornis cassini* (Malherbe) of Guiana, etc., but more heavily barred beneath, the black bars predominating; breast strongly washed with ochraceous tawny; wing-coverts plain, without any wash of red. Wing (type), 94; tail (worn), 48; exposed culmen, 20; tarsus, 15.

Type, No. 66,678, Collection Carnegie Museum, adult male; Malagita, Choco, Colombia, May 15, 1918; M. A. Carriker, Jr.

Nonnula frontalis pallescens, subsp. nov.

Similar to *Nonnula frontalis frontalis* (Sclater), but under parts much paler, the throat and breast cinnamon buff or clay color, and the abdomen and under tail-coverts nearly white.

Type, No. 49,517, Collection Carnegie Museum, adult female; Fundacion, Santa Marta, Colombia, October 6, 1915; M. A. Carriker, Jr.

Odontophorus variegatus, sp. nov.

With a general resemblance to *Odontophorus atrifrons* Allen, but black of crown more extended, reaching the nape, which is argus brown; white shaft streaks on scapulars much wider, the feathers boldly blotched with black and chestnut, giving the back a prominently spotted and streaked appearance; under parts more grayish, less brownish, with less black spotting and barring, the light areas white or nearly so, instead of deep buffy. Wing (type), 139; tail, 80; exposed culmen, 17.5; tarsus, 44.

Type, No. 59,552, Collection Carnegie Museum, adult male; La Pica, Santander, Colombia, February 16, 1917; M. A. Carriker, Jr.

Crypturus idoneus, sp. nov.

Nearest apparently to *Crypturus cinnamomeus cinnamomeus* (Gray), but under parts very much paler, dull neutral gray, washed with pale buffy, the chest and abdomen entirely of this color; upper parts more uniform and more rufescent, the crown in particular. Wing (type), 166; tail, 50; exposed culmen, 28.5; tarsus, 43.

Type, No. 9,206, Collection Carnegie Museum, adult male; Bonda, Santa Marta, Colombia, March 30, 1898; Mrs. Herbert H. Smith.

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PROCEEDINGS

OF THE

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A NEW TEXAN PARAJULUS.

BY RALPH V. CHAMBERLIN.

In a collection of diplopods sent to me for identification by Mr. John J. Davis of the U. S. Entomological Laboratory at LaFayette, Ind., was a specimen of an undescribed species of *Parajulus* taken by J. D. Mitchell at Victoria, Texas, on Nov. 30, 1915, and reared to maturity at LaFayette. This form is described below.

Parajulus ligifer, sp. nov.

Male.—Body in general brown; a row of black spots over the repugnatorial glands along each side and a middorsal longitudinal black line; above level of the pores each segment is brown over the telescoped portion, darker elsewhere, the darker portion geminate transversely and irregularly by a light band. Anal scutum and valves blackish. Antennae blackish. Head dusky above, pale below level of eyes. Vertigial sulcus obscure or absent; a curved sulcus from the inner angle of each eye to a setigerous foveola and the two foveolae connected by a sulcus or furrow slightly curved dorsad. Eye-patch subtriangular with the dorsal angle acute and the others obtuse; sides convex. Ocelli in nine transverse series; e. g., 12, 11, 10, 10, 9, 8, 7, 6, 5, a total of seventy-eight. First dorsal plate long, lower margin straight; deeply margined below but with no other distinct sulci or striae other than the margining one on each side. Second and succeeding segments deeply longitudinally striate below. No longitudinal stria at level of pore. Repugnatorial pore moderately large; in line with the deeply impressed segmental suture which is strongly curved about it. Anal tergite with tip acute, straight, and much exceeding the valves. Inner border of the latter not at all raised, transversely striate. Mandibular stipes not excavated, strongly angularly produced ventrad, the lower angle almost attaining the level of the labral margin of head. First legs strongly enlarged as usual; the penult article long and straight, not at all curved, the inner face flat. Second coxae greatly enlarged in the usual way, produced ventrad in a linguiform process which is straight, narrowed gradually distad but with the distal angles slightly flaring. In the general character

of the gonopods pertaining to the group embracing *victorianus* and *zakiwanus* Chamb., but obviously different in details of form from those species. Anterior plate of first gonopods straight, broadly oblong, distally rounded. Posterior division of anterior gonopods more strongly chitinous and blade-like, glabrous; narrowed strongly above base; at distal third abruptly geniculate. Posterior gonopods very broad curved blades which overlap at their apices, the latter rounded and entire, not bifid as in *victorianus*. Number of segments in type, fifty-four. Length, near 40 mm.

Type in Museum of Comparative Zoology, Cambridge.

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A NEW GENUS FOR TETTIGONIA TRIFASCIATA SAY. (HOMOPTERA; EUPTERYGIDAE.)

BY W. L. McATEE.

Tettigonia trifasciata Say falls, according to the latest arrangement[1] of the genera of the Eupterygidae in the genus *Erythroneura* Fitch. However, it differs from other species of that genus, and indeed from all members of the family, so far as I am aware, in having the scutellum thickened and distinctly elevated apically. Seen from the side the dorsal outline is conspicuously interrupted by the prominent scutellum in this species; in others it is smooth. This notable difference in structure is accompanied by less important variations in venation, which in themselves make it undesirable to retain the species in *Erythroneura*. The second apical vein is curved, reaching margin at exterior angle of tegmen, and not infrequently it nearly or quite forms a stalk with first apical vein. In typical *Erythroneura*, the second apical vein clearly reaches the posterior margin of tegmen, and rarely, if ever, is united in a stalk with first apical vein.

For these reasons, therefore, and chiefly on account of the nature of the scutellum, I propose for the reception of this species, the genus:

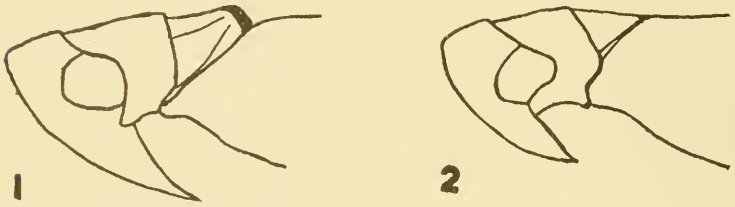
Hymetta, new genus.

Type species: *T.* [*ettigonia*] *trifasciata*, Say, Thomas. Descriptions of new Hemipterous insects collected in the Expedition to the Rocky Mountains, performed by order of Mr. Calhoun, Secretary of War, under command of Major Long. Journ. Acad. Nat. Sci. Philadelphia, Vol. 4, 1825, pp. 344–345 [Missouri]. Complete writings, Vol. II, 1859, pp. 259–260.

Both the fore and hind wings of this species are broader than those pos-

[1] McAtee, W. L., Proc. Biol. Soc. Wash., Vol. 31, pp. 109–123, Nov. 29, 1918.

sessed by most of its relatives; the hind wings being particularly ample. The most common color forms of the species have these broad wings milky white with the head and thorax shaded from ivory color to reddish brown. The fore wings are delicately marked with smoky to black, and orange to scarlet markings. In the dim spaces between the luxuriant dark green plants of a sphagnum bog, where I first realized the beauty of these little insects, their milky coloring seemed almost to glow, as they leaped from plant to plant in quick yet sailing flights. Then I wished I might have the privilege of naming so beautiful a creature in a way to commemorate its alabastrine color and its marbled tracery. After considerable study of the group, the need of a new generic name becoming apparent, I have made one from the name of a mountain, which among the ancient Greeks was famed for its wild flowers, its bees and honey, and its beautiful marble.



Scutellum and adjacent parts seen from side. Fig. 1.—*Hymetta trifasciata;* Fig. 2.—*Erythroneura obliqua.*

Hymetta trifasciata is a common species and has been recorded from territory having the following States as its limits: New York, Tennessee, Mississippi, Wisconsin and Kansas, a range here extended to Texas.

About Washington, D. C., the species has been taken on grape and hickory but is found in largest numbers and is most easily collected when hibernating among fallen leaves.

Markings of *Hymetta trifasciata* besides the crossbands described below which are always or nearly always present are the following: the jet black tip of the elevated scutellum; a black dot on corium near a point on claval suture about two-fifths of its length from apex of clavus; and dots and flecks over clavus and adjacent parts of corium varying through dusky to orange and scarlet.

Key to the Color Varieties.

This key is based largely on the character of the colored crossbands of the tegmen. In the full color pattern these are three in number: (1), a broad interrupted dusky band (darkest at edges) across middle of clavus and on corium to front end of costal plaque; (2) a narrower interrupted band just in front of cross-veins, which often is bordered behind by a red line running to costal margin; and (3) a narrow dusky stripe, obliquely across apical cells to exterior apical angle of tegmen.

A. Crossband 1 dusky.
B. Crossband 2 dusky, margined posteriorly with red. var. *trifasciata*.
BB. Crossband 2 obsolete.
C. Crossband 1 prominent, 3 faint. var. *balteata* n. var.
CC. Crossband 1 obsolete, 3 faint. var. *albata* n. var.
AA. Crossband 1 chiefly red, 2 orange to red, and 3 faint. var. *anthisma* n. var.

Hymetta trifasciata var. **trifasciata** Say.

This variety is that in which the crossbands are most distinct, especially 2, and the interrupted dusky band bordered posteriorly with reddish. In addition to the common characters previously mentioned this variety usually has an irregular parenthesis, two dots, and a short median posterior streak on vertex, markings near the anterior angles and on median line, especially behind, of pronotum, reddish.

Hymetta trifasciata var. **balteata,** new variety.

This variety seems to be more common than the last; besides crossband 2 being obsolete, the red markings on head and thorax usually are lacking, these parts of body being ivory color often shading into reddish brown anteriorly.

Type, a female from Plummers Island, Md., December 4, 1913, W. L. McAtee. (Writer's collection.)

Other specimens examined are from Virginia, District of Columbia, Kansas and Texas.

Hymetta trifasciata var. **albata,** new variety.

This variety almost entirely lacks the red markings, has crossband 1 represented only by a dusky shade, 2 by a short dark line near costa, and 3 faint.

Type, a female from Plummers Id., Md., September 13, 1914, W. L. McAtee. (Writer's collection.)

Paratype, a female from Church's Id., N. C., October 15, 1918, W. L. McAtee.

Hymetta trifasciata var. **anthisma,** new variety.

The most richly colored variety; the tegminal maculae scarlet; crossband 1 dull crimson darker edged; and crossband 2 varying from orange to scarlet. The markings on head and thorax which are red in the typical variety are pale yellow or wanting in this variety; one specimen has a median orange vitta abbreviated in front, on pronotum.

Type, a female from Dallas, Texas, September 12, 1907, on grape (U. S. N. M.).

Paratype, a female from Odenton, Md., August 14, 1918, on hickory, W. L. McAtee.

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OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

A NEW ALSOPHILA FROM GUATEMALA AND VERACRUZ.[1]

BY WILLIAM R. MAXON.

The following new species of Alsophila from Alta Verapaz, Guatemala, and Veracruz has been noted in preparing a brief account of the tree ferns of Mexico, soon to be published.

Alsophila scabriuscula Maxon, sp. nov.

Arborescent, the caudex presumably stout and several meters high; fronds very ample, the stipe stout, 2 to 3 cm. in diameter, armed at the base with numerous slender, conical, dark brown spines about 4 mm. long; blades at least 2.5 meters long, subtripinnate; primary rachis stout, pale brown, 1 to 1.5 cm. thick, sparsely short-aculeate toward the base, densely but laxly hirsute with pale septate hairs, everywhere scabrous at length from their persistent inflated bases; pinnae spreading or the lower ones slightly deflexed, narrowly oblong, acuminate, 50 to 75 cm. long, 18 to 30 cm. broad, the secondary rachis deeply bisulcate above, hirsute, scabrous beneath with age; pinnules 30 to 35 pairs, approximate, spreading, sessile, oblong-linear, long-acuminate, 10 to 15 cm. long, 1.8 to 3 cm. broad, subpinnatisect, the costa densely griseous-hirsute above with curved antrorse septate hairs, less copiously griseous-hirsute beneath with long spreading septate hairs (at length scabrous) and bearing occasional small deciduous bullate yellowish scales toward the base; segments 25 to 30 pairs, linear to linear-oblong, acutish, 9 to 17 mm. long, 2.5 to 5 mm. broad, subfalcate, with narrowly acute to narrowly or (in fertile specimens) broadly quadrate sinuses, herbaceous, deeply incised, the lobes usually bidentate; costules and veins sparsely spreading-hirsute beneath and with a thin covering of minute, closely appressed septate hairs, very sparsely and deciduously hirsute above; veins about 12 pairs, those of the fertile segments once forked or with a pair of opposite excurrent branches, those of the sterile segments mostly with 2 pairs of pinnately arranged branches; sori mostly 7 to 9 pairs, small, seated at the fork of the vein, at the base of the lobe; receptacles stout, capitate, bearing a few long septate hairs.

Type in the U. S. National Herbarium, no. 830528, collected near Cubil-

[1]Published with the permission of the Secretary of the Smithsonian Institution.

quitz, Alta Verapaz, Guatemala, altitude 350 meters, August, 1900, by H. von Türckheim (John Donnell Smith, no. 7806). There are at hand three additional specimens from the type locality, collected by von Türckheim in October, 1906 (II. 1454); these agree perfectly with the type and, like that, are wholly fertile. There are also referred here four specimens, consisting of large sterile pinnae, collected near Córdoba, Veracruz, Mexico, 1889 to 1891, by Hugo Fink (no. 5). They differ slightly in having more numerous bullate scales at the base of the segments beneath and the veins mostly with two pairs of branches; but these doubtless are only vegetative characters directly associable with sterility.

Alsophila scabriuscula is nearest related to *A. mexicana* Mart. and *A. bicrenata* (Liebm.) Fourn., of the same general region. The former species, usually known as *A. Godmani* Hook., differs in having the segments truly pinnatifid, and both the primary and the secondary rachises furnished with occasional large, flat, persistent, white scales; and the latter species, has much smaller, narrower pinnules, the segments glabrous above, and the costules beset with numerous persistent, white, bullate scales beneath. It is hardly to be doubted that the trunks and stipes would furnish good diagnostic characters also, but these are the parts usually neglected by collectors.

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OF THE

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MUTANDA ORNITHOLOGICA.

VII.

BY HARRY C. OBERHOLSER.

The names of five species of South American birds, belonging to the families Cotingidae, Tyrannidae, Mimidae and Icteridae, apparently require to be changed. Their names and the reasons for the nomenclatural alterations are given below.[1]

Family COTINGIDAE.

Attila cinereus (Gmelin).

The use of *Muscicapa cinerea*[2] Gmelin for the bird commonly known as *Attila cinereus* is prevented by *Muscicapa cinerea* Müller,[3] which is now known as *Graucalus cinereus* (Müller). The proper title for the species of Cotingidae becomes, therefore, *Attila rufus* Lafresnaye,[4] proposed as a substitute name for *Muscicapa cinerea* Gmelin.

Family TYRANNIDAE.

Knipolegus comatus (Lichtenstein).

The name *Knipolegus comatus* for a South American tyrant flycatcher is now seen to be untenable, for its original combination, *Muscicapa comata* Lichtenstein,[5] is preoccupied by *Muscicapa comata* Gmelin.[6] The next available designation is *Knipolegus lophotes* Boie,[7] and the species should, therefore, stand as *Knipolegus lophotes* Boie.

[1] For the six previous articles in this series, *cf.* Proc. Biol. Soc. Wash., XXX, March 31, 1917, pp. 75–76; July 27, 1917, pp. 125–126; *ibid.*, XXXI, May 16, 1918, pp. 47–49; November 29, 1918, pp. 125–126; *ibid.*, XXXII, February 14, 1919, pp. 7–8; April 11, 1919, pp. 21–22.

[2] Syst. Nat., I, ii, 1789, p. 933 (Cayenne).

[3] Vollständ. Natursyst. Suppl., 1776, p. 171 (Madagascar).

[4] Rev. Zool., 1848, p. 46.

[5] Verz. Doubl., 1823, p. 55 (Sao Paolo, Brazil).

[6] Syst. Nat., I, ii, 1789, p. 941 (Ceylon).

[7] Isis, 1826, col. 973.

Euscarthmus gularis (Temminck).

The *Muscicapa gularis* of Temminck,[1] which is now employed for a Brazilian species of Tyrannidae as *Euscarthmus gularis*, is interdicted by *Muscicapa gularis* Stephens,[2] a name now relegated to the synonymy of *Dessonornis caffra* (Linnaeus). The next name available is *Todirostrum rufilatum* Hartlaub,[3] and the species must, therefore, hereafter stand as *Euscarthmus rufilatus* (Hartlaub).

FAMILY MIMIDAE.

Mimus lividus (Lichtenstein).

The name *Mimus lividus*, long applied to a well-known South American mockingbird, proves to be untenable, since its basis, *Turdus lividus* Lichtenstein,[4] is rendered invalid by *Turdus lividus* Wilson,[5] which is now relegated to the synonymy of *Lucar carolinensis* (Linnaeus). The only other name which could possibly be used for the species is *Turdus orpheus* Spix,[6] which in part applies to it; but this in turn is preoccupied by *Turdus orpheus* Linnaeus,[7] which is now known as *Mimus polyglottos orpheus* (Linnaeus), and is, therefore, in any case unavailable. Since *Mimus lividus* (Lichtenstein) is thus devoid of any specific designation, we propose to call it **Mimus antelius,** nom. nov.

FAMILY ICTERIDAE.

Curaeus aterrimus (Kittlitz).

The Chilean bird now known as *Curaeus aterrimus* (Kittlitz)[8] has an early name in *Turdus curaeus* Molina,[9] and the species must therefore stand as *Curaeus curaeus* (Molina).

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[1]Nouv. Rec. Planch. Col. d'Ornith., III, livr. 28, November, 1822, pl. 167, fig. 1 (Brazil).

[2]Shaw's Gen. Zool., X, 1817, p. 392 (loc. ign.).

[3]Journ. f. Ornith., 1855, p. 98 (Brazil).

[4]Verz. Doubl., 1823, p. 39 (Bahia, Brazil).

[5]Amer. Ornith., II, 1810, p. 90, pl. XIV, fig. 3 (ex Bartram) (eastern Pennsylvania)

[6]Avium Spec. Nov. Bras., I, 1824, p. 71, pl. LXXI (Joazeiro, San Francisco R., Prov. Rio Janeiro, Brazil).

[7]Syst. Nat., ed 10, I, 1758, p. 169 (Jamaica, West Indies).

[8]*Sturnus aterrimus* Kittlitz, Mém. Acad. St.-Pétersb., 1835, p. 467, pl. II, (Valparaiso, Chile).

[9]Sagg. Stor. Nat. Chili, 1782, p. 252 (Chile).

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

SUMMARY OF NOTES ON WINTER BLOOMING AT WASHINGTON, D. C.

BY W. L. McATEE.

The very mild winter of 1918–1919 has resulted in various unusual phenomena of plant bloom in the neighborhood of Washington, D. C., which inspire interest in similar records in the past for this vicinity. Ward in his Guide to the Flora of Washington[1] recognizes only early flowering, and autumnal flowering (meaning a distinct second blooming season) as unusual bloom phenomena.

Another category would seem to be needed to include those plants with long-persistent flowers or a habit of producing new flowers up to the extreme limit of endurance of the unfavorable conditions of approaching winter. For this phenomenon and present purposes, the simple term "late-flowering" will suffice. It is most satisfactory to group by themselves also, those plants that bloom at any time conditions are favorable.

Autumnal Flowering.[2]

As used here autumnal flowering means a distinct new period of bloom for plants normally blooming earlier in the year. This has been observed[3] in the following plants:

Hair grass (*Agrostis hyemalis*) November 12, 1876.
Chickweed (*Stellaria aquatica*) December 8, 1918.
Hepatica (*Hepatica triloba*) December 22, 30, 1918.
Buttercup (*Ranunculus abortivus*) November 28, 1875.
Bitter Cress (*Cardamine hirsuta*) October 3, 1880.
Dewberry (*Rubus villosus*) September 22 and October 27, 1878.

[1] Bul. 22, U. S. Nat. News. 1881, pp. 26–33.

[2] In this and other sections of the paper are included notes kindly furnished by various individuals, to whom acknowledgment is here gratefully recorded.

[3] Notes of Ward, L. F. Loc. cit., also Field and Forest, III, Nos. 10–12, April–June, 1878, p. 172, and Chickering, op. cit. I, Nos. 5–6, Oct.-Nov., 1875, pp. 43–44 are incorporated.

Strawberry (*Fragaria virginiana*) September 22, 1878.

Bird's foot violet (*Viola pedata*) September 22, 1878, October 31, 1918, December 8, 1878.

White violet (*Viola striata*) September 22, 1878; about Christmas, 1918.[1]

Golden Alexanders (*Zizia aurea*) November 16, 1918.

Flowering dogwood (*Cornus florida*) October, 1918.

Azalea (*Azalea nudiflora*) October 13, 1878.

Laurel (*Kalmia latifolia*) Autumn, 1874.

Deerberry (*Vaccinium stamineum*) October 13, 1878.

Pink Gentian (*Sabatia angularis*) October 27, 1878.

Sweet William (*Phlox divaricata*) October 16, 1873.

Blueweed (*Echium vulgare*) October 8, 1880.

Speedwell (*Veronica officinalis*) October 8, 1873.

Bluet (*Houstonia caerulea*) September 7, 1879, December 8, 1918.

Bluet (*Houstonia purpurea*) October 13, 1878.

Bluet (*Houstonia angustifolia*) September 12, 1880.

Honeysuckle (*Lonicera japonica*) October 13, 1878; various dates up to December 1, 1918.

Professor Chickering, in the article cited, noted that strawberries and black-berries produced ripe fruit from autumnal flowers in 1875.

Late Flowering.

The flowers that normally bloom or continue to bloom in autumn include among their number several which on account of their extreme persistency in putting forth new flowers, or because of the conspicuous lasting qualities of their bloom, form the interesting group, referred to previously, which may best be discussed under the head of late flowering. Special attention was given to this group in the latter months of 1918. Despite the fact that the dates recorded were preceded by numerous severe frosts the following 17 species were observed in bloom:

Carpet weed (*Mollugo verticillata*) November 17.

Peppergrass (*Lepidium virginicum*) December 8, 26.

Witch hazel (*Hamamelis virginiana*) December 1.

Red clover (*Trifolium pratense*) November 16.

Sweet clover (*Melilotus alba*) November 16.

Mercury (*Acalypha virginica*) November 16.

Spurge (*Euphorbia corollata*) November 16; flowers very dry, papery.

Goldenrod (*Solidago caesia*) December 8.

Goldenrod (*Solidago bicolor*) November 16, December 1.

Goldenrod (*Solidago erecta*) December 6.

Goldenrod (*Solidago racemosa*) November 16, December 1.

Aster (*Aster patens*) November 16, December 1, 30.

Aster (*Aster cordifolius*) December 8.

Aster (*Aster linariifolius*) November 17.

Yarrow (*Achillea millefolium*) November 16, December 1, 8, 30.

[1]Cultivated.

Tansy (*Tanacetum vulgare*) December 30.

Fireweed (*Erechtites hieracifolia*) November 16.

Early Flowering.

Early flowering, which gives us some of the most enjoyable instances of winter bloom, apparently can be separated from autumnal flowering in certain cases, only by an arbitrarily chosen date. In this locality the month of December is normally mild, and as noted in previous paragraphs, yields numerous cases both of "late" and "autumnal" flowering. January is definitely a winter month and naturally carries the impression of earliness while December often is a continuation of the autumn and in every way is associated with lateness. It would seem best therefore to select January 1 as the date after which flowering should be classified as early. Confining records of early flowering to actual winter months, it is noted that the following flowers have been observed in bloom in Washington region in January and February.[1]

Spear grass (*Poa annua*) Winter 1876.

Blue grass (*Poa pratensis*) January 5, 1918.

Skunk cabbage (*Symplocarpus foetidus*) February 29, 1880; January 12, 1913.

Weeping willow (*Salix babylonica*)[2] February 22, 1874.

Silver poplar (*Populus alba*)[2] February 22, 1874.

Alder (*Alnus rugosa*) January 12, 1913, February 28, 1915, February 22, 1919.

Alder (*Alnus glutinosa*)[2] February 22, 1919.

Elm (*Ulmus americana*) February, 1876.

Chick-weed (*Cerastium viscosum*) February 29, 1880.

Spring beauty (*Claytonia virginica*) February 19, 1876, February 29, 1880.

Hepatica (*Hepatica triloba*) February 20, 1876, January 5, 1913, February 2, 25, 1919.

Christmas rose (*Helleborus niger*) early February, 1919.[2]

Creeping buttercup (*Ranunculus repens*) Winter, 1876.

Whitlow grass (*Draba verna*) January, February, 1876; February 24, 1878; February 16, 1913.

Peppergrass (*Lepidium virginicum*) January 5, 1918.

Shepherd's purse (*Capsella bursa-pastoris*) January, 1876.

Golden saxifrage (*Chrysosplenium americanum*) February 17, 1878.

Broom (*Cytisus scoparius*)[2] February 14, 1919.

Silver maple (*Acer saccharinum*) January 15, 1876; February 15, 24, 1878; February 23, 1919.

Red maple (*Acer rubrum*) February 29, 1880; February 13, 1909; February 2, 1913; February 28, 1915; February 9, 1919.

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[1]Data from personal observations, from Ward. (loc. cit.) and from Field and Forest, Vol. 1, Nos. 8–9, Jan. Feb. 1876, p. 72; Nos. 10–11, March-April, 1876, p. 88; No. 12, May, 1876, p. 94; Vol. III, Nos. 10–12, April-June, 1878, p. 151, and Forest and Stream, Vol. 6, No. 8, March 30, 1876, p. 115.

[2]Cultivated.

Trailing arbutus (*Epigaea repens*) January, 1919.

Yellow jessamine (*Jasminum nudiflorum*)[1] January, 1876; January 1, 1919.

In addition to the above plants, the Golden Bells (*Forsythia* spp.), it is believed, sometimes bloom in the true winter months, although no definite date of their so doing is now at hand.

During the winter of 1918–1919, various herbaceous plants as *Senecio, Capnoides, Arabis, Galium,* and *Veronica* seemed more fully grown than usual. Elder (*Sambucus canadensis*) and certain cultivated roses had put out leaves up to an inch in length in February.

Casual Flowering.

In an entirely separate category should be placed two irrepressibles which bloom at the slightest encouragement. These are the chickweed (*Stellaria media*) and the dandelion (*Taraxacum officinale*). Sample dates of winter flowering of the former are: December 6, 18, 25, 30; January 5; February 19, 20; and for the latter: November 16; December 1, 8, 23, 25, first week of January and February 2. Two of the other plants previously mentioned seem bent on entering this class, namely hepatica and peppergrass. The moss pink (*Phlox subulata*)[1], according to Dr. E. T. Wherry, has been in bloom in every month during the winter of 1918–1919.

In the writer's former home—Indiana—one of the common blue or johnny violets bloomed at almost any season; here the only violet that manifests such a tendency—and that to a much lesser degree—is the birdsfoot violet.

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[1]Cultivated.

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OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

TWO NEW NORTH AMERICAN ANTHOMYIIDAE (DIPTERA).

BY J. R. MALLOCH.

The two species described in this paper have been in my hands for two years or more, having been submitted by the United States Bureau of Biological Survey for identification. Some of the paratypes of the second species were sent to me nearly two years ago by Dr. R. R. Parker from Montana. The type specimens will be deposited in the National collection.

Mydaea winnemana, sp. n.

Male and female.—Black, glossy. Orbits, face, and cheeks in both sexes with white pruinescence; interfrontalia of female opaque black, triangle shining. Antennae and palpi black, second antennal joint, and third at base brownish. Thorax with faint grayish pruinescence, the disc with two narrow black vittae which are visible only on anterior half. Abdomen with a very faint dorso-central vitta. Legs reddish or yellowish-testaceous, femora basally in variable degree, and tarsi entirely blackened. Wings clear, veins pale brown. Calyptra white. Halteres yellow.

Male.—Eyes bare, separated by about width across posterior ocelli; parafacial in profile almost invisible; cheeks not distinctly higher than width of third antennal joint, with a marginal series of fine bristles; vibrissa very strong; antenna extending nearly to mouth margin, third joint nearly 3 times as long as second; arista with the longest hairs distinctly longer than width of third antennal joint; palpi normal. Prealar bristle very small; postsutural dorso-centrals 4; hypopleura with a few microscopic hairs near lower posterior angle. Abdomen broadly ovate; fifth sternite with a broad rounded posterior marginal excision, a long bristle on each side at base of excision. Fore tibia unarmed; mid tibia with 3 posterior bristles; hind femur with a series of short, fine bristles on antero-ventral surface, which become longer apically, and a few short, fine bristles on basal half of postero-ventral surface. Veins 3 and 4 divergent apically.

Female.—Eyes at vertex separated by a little less than one-third of the head width, the frons widened anteriorly; each orbit with 5 or 6 moderately strong bristles and numerous short setulose hairs; triangle continued to

considerable proximad of middle of frons; head higher than in male; parafacial distinct but not as wide as the slender third antennal joint; palpi broad. Otherwise as male.

Length, 5–6 mm. Type, male, Plummer's Island, Md., August 28, 1912. Allotype, Little Falls, D. C., August 22, 1915 (W. L. McAtee). This species very closely resembles *Hebecnema nigricolor* Fallar, a European species, which I supposed it to be until I obtained authentic European specimens of that species.

Hylemyia montana, sp. n.

Male.—Black subopaque, densely brownish gray pruinescent. Head yellowish testaceous, occiput fuscous, gray pruinescent; antennae black, second joint brown; arista pale except at base; palpi fuscous. Thorax indistinctly trivittate. Abdomen with a poorly defined dorso central dark vitta; hypopygial forceps yellowish, tips yellow. Coxae and all femora largely fuscous, tarsi black. Wings yellowish, veins pale. Calyptra and halteres yellow. Eyes separated by a little more than width of anterior ocellus; arista with its longest hairs a little less than as long as width of irregularly 2-rowed, sternopleurals 1:2. Abdomen slender, depressed; fifth sternite with long narrow processes, each of which has some long bristles along the middle directed slightly laterad and caudad, and 4 or 5 short equal sized closely placed setae at apex on inner margin directed mesad and sometimes cruciate; inferior forceps long, thick at base, tapered to a slender point, each with a few short hairs at tip on inner side. Fore tibia usually with a median posterior bristle, the apex with a long curved blunt black bristle on posterior side at apex; fore tarsus compressed, about as long as tibia; mid tibia with 3 or 4 very short setulae on posterior surface; mid tarsus very much shorter than its tibia; hind femur with a complete series of strong bristles on antero-ventral surface and a series of closely placed short bristly hairs on postero-ventral; hind tibia with 3 or 4 antero-ventral, 3 to 5 antero-dorsal, and 3 postero-dorsal bristles, the posterior surface with a few setulose hairs on basal half; tarsus very little and shorter than tibia. Costal thorn short; outer cross-vein nearly straight.

Length, 5–6 mm. Type, Denver, Colo., June 15, 1916 (E. C. Jackson).

Paratypes, Denver, Colo., July 19, 1914 (O. E. Jackson); Crow agency, Montana, July 10, 1916 (R. Kellogg); Bozeman, Mont., July 3, 10, 15; Florence, Mont., June 22, 1912; Armstead, Mont., July 3, 1913; Miles City, Mont., July 15–16, 1915.

Differs from *coarctata* Fallen in having the hind femora with postero-ventral setulose hairs and the forceps differently shaped.

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OF THE

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THE STATUS OF THE SUBGENUS SIEBEROCITTA COUES.

BY HARRY C. OBERHOLSER.

The subgenus *Sieberocitta* is an interesting case. Originally proposed by Dr. Elliott Coues[1] with *Cyanocitta ultramarina* var. *arizonae* Ridgway as its monotypic type, it has been until very lately rejected as based solely on color characters. Mr. H. S. Swarth in a recent publication[2] has properly called attention to the fact that this subgeneric distinction was originally made on structural as well as color differences. On this basis Mr. Swarth has revived *Sieberocitta* as a subgeneric group to include *Aphelocoma sieberii* (Wagler) and its subspecies, leaving all the subspecies of *Aphelocoma californica* in the typical subgenus. Mr. Swarth did not examine the two Mexican species *Aphelocoma unicolor* (Du Bus) and *Aphelocoma guerrerensis* Nelson, which, as it happens, are the key to the whole problem. An investigation of these two species shows at once that color is here of little or no value as a group distinction, and that we must make our division, if at all, on structural characters alone. The type of *Sieberocitta* differs from *Aphelocoma californica*, the type of true *Aphelocoma*, in having the tail rounded and shorter than the wing instead of graduated and longer than the wing. So far as the other species of these two groups are concerned, the shape of the tail is of little or no importance as a subgeneric character, for it is at most but relative, and does not hold in all the species under consideration.

By the above criterion, *Aphelocoma unicolor*, which in pattern of coloration is decidedly different from that of the species of either group, is clearly referable to *Sieberocitta*. On the other

[1] Key North Amer. Birds, ed. 5, I, 1903, p. 497.

[2] Univ. Calif. Publ. Zool., XVII, No. 13, February 23, 1918, pp. 406–407.

hand, *Aphelocoma guerrerensis*, a bird closely resembling *Aphelocoma unicolor* in coloration, although, by the way, a perfectly distinct species, has the tail usually slightly longer than the wing, in some cases about equal, and occasionally even shorter, thus occupying an intermediate position, though certainly more inclining toward the subgenus *Aphelocoma*. Were it not for *Aphelocoma guerrerensis*, the case would be relatively simple, as all the other species fall well within the limits of one group or the other, and, indeed, *Sieberocitta* could then well be a distinct genus.

This case of *Sieberocitta* is another good example of what we consider the real difference between a genus and a subgenus, for here two groups, which are well characterized by structural differences, are connected by a species which is perfectly intermediate. Did this species not exist, we would have two trenchantly different groups which would naturally stand as distinct genera. Many authors do not recognize subgenera, but such divisions are often of considerable use in more clearly showing the relative affinities of more or less closely allied species which can not be separated generically.

Although under existing circumstances we can not consider *Sieberocitta* a distinct genus, the recognition of two subgenera, as Mr. Swarth proposes, seems desirable. The forms of each are as follows:

SIEBEROCITTA.

Aphelocoma sieberii sieberii (Wagler).
Aphelocoma sieberii colimae Nelson.
Aphelocoma sieberii potosina Nelson.
Aphelocoma sieberii arizonae (Ridgway).
Aphelocoma sieberii wollweberi (Kaup).
Aphelocoma sieberii couchii (Baird).
Aphelocoma unicolor unicolor (Du Bus).
Aphelocoma unicolor coelestis Ridgway.

APHELOCOMA.

Aphelocoma guerrerensis Nelson.
Aphelocoma cyanea (Vieillot).
Aphelocoma californica californica (Vigors).
Aphelocoma californica immanis Grinnell.

Aphelocoma californica obscura Anthony.
Aphelocoma californica hypoleuca Ridgway.
Aphelocoma californica grisea Nelson.
Aphelocoma californica cyanotis Ridgway.
Aphelocoma californica sumichrasti Ridgway.
Aphelocoma californica texana Ridgway.
Aphelocoma californica woodhouseii (Baird).
Aphelocoma insularis Henshaw.



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PROCEEDINGS

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GENERAL NOTES.

SPIZELLA ARBOREA THE PROPER NAME FOR THE TREE SPARROW.

Mr. Mathews is quite right in his contention (Auk, XXXVI, No. 1, January, 1919, p. 114) that *Spizella monticola* (Gmelin) can no longer be used for the North American Tree Sparrow. In calling attention (Proc. Biol. Soc. Wash., XXXI, June 29, 1918, p. 98) to the identity of *Fringilla canadensis* Boddaert (Tabl. Planch. Enlum. d'Hist. Nat., 1783, p. 13) with *Zonotrichia leucophrys*, it did not occur to us to verify the original basis of *Spizella monticola* (Gmelin), since we assumed that it had hitherto been correctly identified. It now appears, however, as Mr. Mathews has concluded, that this name is not correctly applicable to the Tree Sparrow. Such parts of Gmelin's diagnosis as are not incorrect might apply to either *Spizella monticola* or *Zonotrichia leucophrys*, excepting the expression "Rostrum rubescens," which is characteristic of only *Zonotrichia leucophrys* in juvenal plumage. Of the five references given by Gmelin, all but the last refer undoubtedly to *Zonotrichia leucophrys;* but Pennant's description of his "Tree Finch" (Arctic Zoology, II, 1785, p. 373) relates wholly to the Tree Sparrow. The *Fringilla monticola* of Gmelin is thus a composite term, but since the diagnosis and four of the references belong to *Zonotrichia leucophrys*, we must consider Gmelin's name a synonym of the latter. This being the case, another technical designatiom must come into use for the Tree Sparrow.

The next name in the usual synonymy of *Spizella monticola* (Auct. nec Gmelin) is *Fringilla canadensis* Latham (Ind. Ornith., I. 1790, p. 434), but this has practically the same basis as Gmelin's name, since Latham cites the first four references given by Gmelin, and in addition, Gmelin's own *Fringilla monticola*, but omits the Tree Finch of Pennant's Arctic Zoology. Thus *Fringilla canadensis* Latham is even more clearly pertinent to *Zonotrichia leucophrys* than is *Fringilla monticola* (Gmelin), and must be, of course, a synonym of the former. This leaves *Fringilla arborea* Wilson (Amer. Ornith., II, 1810, p. 123, pl. xvi, fig. 3; eastern Pennsylvania) as the only available name for the eastern Tree Sparrow. This species and its western subspecies will now require, therefore, to be called *Spizella arborea arborea* (Wilson), and *Spizella arborea ochracea* Brewster.

The present incident emphasizes anew the fallibility of human accomplishment, as well as the necessity for reverifying the original references and bases of all current scientific names.

—*Harry C. Oberholser.*

THE PROPER NAME FOR LIMICOLA PLATYRHYNCHA (TEMMINCK).

The current specific name for the broad-billed sandpiper, *Limicola platyrhyncha* (Temminck), seems to be long antedated. Mr. G. M. Mathews has called attention (Austral Avian Record, I, No. 2, April 2, 1912, pp. 31–32; ibid., No. 4, Sept. 18, 1912, pp. 84–85; Birds Australia, III, pt. 3, August 18, 1913, p. 280) to *Scolopax falcinellus* Pontoppidan (Danske Atlas, I, 1763, p. 623, pl. xxvi) which he regards, and we think properly, as clearly applicable to *Limicola platyrhyncha* (Temminck). He states, moreover, that if Pontoppidan's description and plate be considered not sufficient to fix the name on *Limicola platyrhyncha*, that the name could be cited from the subsequent *Scolopax falcinellus* of Brünnich (Ornith. Borealis, 1764, p. 49), which is readily seen to be of undoubted application. This, however, could not be, since *Scolopax falcinellus* Pontoppidan is not a nomen nudum, and consequently if the name *Scolopax falcinellus* be used at all for *Limicola platyrhyncha* it must date from Pontoppidan, because if this author's *Scolopax falcinellus* be unidentifiable, it automatically precludes the use of the same name by any other subsequent author. Holding that *Scolopax falcinellus* Pontoppidan is with sufficient certainty applicable to *Limicola platyrhyncha*, we can regard Brünnich's description as supplementary evidence, since he cites "Pontopp. atl. dan. I. t. 26. fig. 4." The species currently called *Limicola platyrhyncha* must, therefore, be known as *Limicola falcinella* (Pontoppidan).

—*Harry C. Oberholser.*

THE TAXONOMIC POSITION OF THE GENUS RAMPHALCYON.

Mr. W. DeW. Miller, in his excellent revision of the classification of the Alcedinidae (Bull. Amer. Mus. Nat. Hist., XXXI, 1912, pp. 239–311, pls. xxv and xxvi), has shown the peculiar relationships of the genus *Ramphalcyon*. This treatment emphasizes and confirms the points brought out by Fürbringer and other investigators. Notwithstanding the statements of other authors, Mr. Miller's opinion that *Ramphalcyon* is more closely allied to the Daceloninae than to the Alcedininae seems clearly to be borne out by his array of characters. This genus, however, evidently can not be considered merely an intermediate between the Alcedininae and the Daceloninae, since it possesses not only characters that belong to these two subfamilies, but also some characteristics of the Cerylinae, and others of its own besides. These characters have been discussed and compared by Mr. Miller on pages 241–261 of the article above cited. In view of these facts, the taxonomic position of *Ramphalcyon* seems best expressed by the creation of a new subfamily for its reception, an alternative already forecasted by Mr. Miller himself (p. 241). This new monotypic subfamily which is, of course, to be named, **Ramphalcyoninae,** stands probably best between the Alcedininae and the Daceloninae.

—*Harry C. Oberholser.*

THE STATUS OF THE GENUS CENTRONYX BAIRD.

The genus *Centronyx* was originally instituted by Professor Baird (Rep. Explor. and Surv. R. R. Pac., IX, 1858, p. 440) for the reception of the Baird sparrow, *Emberiza bairdii* Audubon. Mr. Ridgway in his "Birds of North and Middle America" (Bull. U. S. Nat. Mus., I, 1901, p. 202) rediagnosed it as a distinct genus, but it has been currently regarded by other authors as only subgenerically different from *Ammodramus* (= *Coturniculus*). An examination of its characters, however, which we have made in connection with the investigation of the affinities of allied groups, seems to indicate that Mr. Ridgway's view of the generic distinctness of *Centronyx* is entirely correct. It differs from *Ammodramus* in having four instead of three primaries sinuated on the outer web; the claw of the hallux not shorter than the hallux itself, and longer than the distance from the anterior end of the nostril to the tip of the maxilla; the wing more than six times the length of exposed culmen; and the tarsus not less than twice the length of exposed culmen. Two characters, however, mentioned by Mr. Ridgway, prove on examination of a series of specimens not to be entirely constant; for the hallux is not always longer than the outer toe; and the sixth primary, counting from the outermost, is not always abruptly shorter than the seventh. These, however, do not impair the validity of the genus, as we have above shown. The only species referable to *Centronyx* is its type, *Centronyx bairdii* (Audubon).

—*Harry C. Oberholser.*

THE GENERIC NAME OF THE ROOK.

By some authors the rook, *Corvus frugilegus* Linnaeus, is placed in a separate genus, by others retained in *Corvus*. When it has been generically distinguished, *Trypanocorax* Kaup (Journ. f. Ornith., 1854, p. lv.; type, *Corvus frugilegus* Linnaeus) has been usually employed as its generic name. Dr. C. W. Richmond, however (Proc. U. S. Nat. Mus., LIII, August 16, 1917, p. 591), has rediscovered the original place of publication of the term *Frugilegus* (Selys-Longchamps, Faune Belge, I, 1842, p. 68 [Lesson Ms.]; type by monotypy and tautonymy, *Corvus frugilegus* Linnaeus) which name, of course, is entirely pertinent, and of earlier date.

A number of authors, and recently Dr. Ernst Hartert in particular, have pointed out the important structural characteristics of this species, differences that clearly indicate its generic distinction. It differs from the typical species of the genus *Corvus* in its relatively slender and more sharply pointed bill (less so, however, than *Heterocorax*); short first primary (counting from the outermost), which equals or is shorter than the ninth, instead of being equal to the seventh; unfeathered, warty face in the adult; absence of narial bristles, and thus entirely exposed nostrils, which condition, so far as we recall, is unique in the family Corvidae.

In view of the above facts, the rook should be called *Frugilegus frugilegus* (Linnaeus). —*Harry C. Oberholser.*

THE "GLASS-SNAKE" OF FORMOSA.

The occurrence of an *Ophisaurus* in Formosa was first announced by Van Denburgh (Proc. California Acad. Sci. (4) vol. 3, Dec. 20, 1909, p. 60). He had not been able to examine the specimen which was then in the collection of the Taiwan Medical School, and he could only suspect its probable identity with Boulenger's *O. harti* (Proc. Zool. Soc. London, 1899, p. 160, pl. 16) from Fokien, China. It was similarly recorded in my paper on "The Batrachians and Reptiles of Formosa" (Proc. U. S. Nat. Mus., vol. 38, May 3, 1910, p. 102).

Dr. M. Oshima has kindly forwarded this specimen which now forms part of the collection of the Institute of Science, Government of Formosa, for my inspection, together with an additional specimen in the same museum and collected about five years ago at Arisan, middle part of the island. Owing to its somewhat different aspect, he thought the two specimens might represent different species.

The first one is older, stouter, with reproduced tail, and from long exposure to light (?) absolutely colorless. The other is younger, more slender, with complete tail, and with a characteristic color pattern.

Fortunately the U. S. National Museum possesses a very good specimen of *O. harti* collected within 200 miles of Foo Chow, Fokien, China, consequently not far from the type locality, which is Kuatun, about 270 miles from the same city.

The three specimens have been carefully compared with the result that no essential difference between them could be found. Slight individual variation is shown in the headshields, but nothing beyond what might be expected in these rather variable lizards. Mr. F. N. Blanchard, my assistant, has made a count of the body scales with the result that the number of transverse series, counted from beginning of lateral groove to vent is 101 and 98 in the two Formosan specimens, and 99 in the Chinese specimen, while the dorsals and ventrals, in a series around the body, are 16 and 10 respectively in all three specimens.

The color pattern of the younger Formosan specimen is essentially that of the Chinese specimen in the National Museum. In these there is a distinct brownish longitudinal line from the eye to the end of the tail between the keels of the third and fourth dorsal scales, and a more faintly indicated and interrupted line down the middle of the back. Between these and connected with them there are a number of dusky lines or bands across the back. The lateral line extends anteriorly through the eye to the loreal region which is all dusky. In the Formosan specimen there is an indication of a narrow pale edge above the lateral line from nostril to side of neck.

I therefore have no doubt that the Formosan specimens are correctly identified as *Ophisaurus harti.* —*Leonhard Stejneger.*

A NEW NYCTELEA NAME

The most common species of this genus has been known lately, under the American Code of Botanical Nomenclature, as *Nyctelea nyctelea* (L.) Britton. Since, however, it is desirable to avoid the use of such duplicate binomials, a new name must be found for this species. Adopting the next available specific name, the plant may be known as **Nyctelea ambigua** (Nutt.) Standl. (*Ipomoea nyctelea* L. Sp. Pl. 160. 1753; *Ellisia ambigua* Nutt. Gen. Pl. **1**: 118. 1818; *Nyctelea nyctelea* Britton, in Britt. & Brown, Illustr. Fl. ed. 2. **3**: 67. 1913. —*Paul C. Standley.*

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A NEW ROCK IGUANA FROM PORTO RICO.

BY THOMAS BARBOUR.

In 1917 Dr. G. M. Allen and Lieut. James Lee Peters visited Porto Rico in the interest of the Museum of Comparative Zoölogy. They explored with great success a large cave near Ciales and found in the floor, under an opening in the high domed roof, a considerable number of both mammal and reptile bones.

The latter have recently been sorted out and substantiate the statement which I made some time ago (Proc. Biol. Soc. Wash., 30, 1917, p. 98) when I said that I believed Dr. Allen had found jaws of Cyclura. In 1918 Miller (Proc. U. S. Nat. Mus., 54, 1918, p. 509, pl. 81) named *Cyclura mattea* from shell heaps in St. Thomas,—a species which proves to be very closely related indeed to the form which I am about to name. It is perhaps not remarkable that the Rock Iguana evidently became extinct in Porto Rico at an early time. It was probably exterminated by the considerable population of Porto Rican Indians before the Conquest, because no tradition of its existence seems to remain amongst either living inhabitants or in the literature. The description of this species likewise fills the last considerable gap in the known distribution of the genus and confirms the surmise ventured by Mr. Noble and myself that Rock Iguanas had formerly been much more widely distributed than their present dispersal would indicate. The limits of the range of the genus coincided exactly with those of the Greater Antillean subregion, including the Bahaman province and thus the distribution of the genus becomes at once more suggestive as it becomes more completely definable.

This form may be known as

Cyclura portoricensis, sp. nov.

Type, M. C. Z. No. 12,460, from the floor of the cave near Ciales, Porto Rico, collected by Allen and Peters in February, 1917; being the extremities of a left humerus.

Paratypes: A femur; tibia; two ulnae; a sacral and several dorsal vertebrae; several incomplete mandibles; as well as a number of other bones less perfect.

The extremities of a fully adult humerus are chosen for the type for comparison with the type of Miller's *C. mattea*, also a left humerus. The two species are evidently very closely related, more so with each other than with other neighboring species of Cyclura, viz., *pinguis* of Anegada or *stejnegeri* and *cornuta*. The species differs from *mattea* in being even larger and more massive. (Cf. Miller, l. c., pl. 81, fig. 4 and 5.) The bones figured herewith are life size as are those figured by Miller. The greatest diameter of the expanded proximal extremity of the type humerus (fig. G) is 35 mm. In an adult Cuban Rock Iguana (C. *macleayi*) about three feet long (M. C. Z. 6915 Santiago de Cuba; Col. Wirt Robinson, coll.) the same dimension is 19 mm.

U. S. N. M. 59,359, humerus, paratype of *C. mattea,* is before me and in this example the distal expansion is 30 mm. and the proximal extremity though broken appears to be correspondingly smaller and less massive. The bicipital depression or radial fossa in *mattea* is very conspicuously deeper and more extensive than in *portoricensis;* in this respect the latter is even more like *stejnegeri* or *cornuta* than is *mattea.* This is what one would expect from its geographic station.

Portoricensis was so far as known the largest member of the entire genus.

I wish to thank Dr. Stejneger and Mr. Miller for permission to compare the paratype of *mattea* with the material in hand.

There is no reason to believe that man has played any part in the dispersal of Cyclura, as has beyond doubt been the case with the spreading of Iguana through the Antilles. The distribution of Iguana is absolutely haphazard, while that of Cyclura, as now definable, is typical of those forms which spread by non-fortuitous or natural means. Cyclura undoubtedly occurred in comparatively recent times on every suitable island which has remained of the once more extensive Greater Antillean land. It is improbable that this list of species with their habitats could be the result of chance dispersal when it is considered that not one Cyclura is found elsewhere

C. macleayi Gray, Cuba and surrounding Cayos.
C. caymanensis Barbour and Noble, Cayman Islands.
C. baeolopha Cope, Andros Isl., Bahamas.
C. inornata Barbour and Noble, Exuma Keys, Bahamas (extinct?).
C. rileyi Stejneger, Watlings Isl., Bahamas.
C. nuchalis Barbour & Noble, Fortune Isl., Bahamas (extinct?).
C. carinata Harlan, Turks and Caicos Isls., Bahamas.

A
B
C
D
E
F
G

C. collei Gray, Jamaica and surrounding cays (extinct?).
C. cornuta (Bonnaterre), Haiti and neighboring islets.
C. nigerrima Cope, Navassa Isl. (extinct?).
C. stejnegeri Barbour & Noble, Mona Isl.
C. portoricensis Barbour, Porto Rico (extinct).
C. mattea Miller, St. Thomas (extinct).
C. pinguis Barbour, Anegada (extinct?).

The existing place names and early literature and tradition prove that Cyclura was previously found upon many other Bahaman Islands where it has completely disappeared.

Explanation of the Plate.

A. Ventral view of left femur.
B. Ventral view of left tibia.
C. Dorsolateral view of left ulna.
D. Dorsolateral view of right ulna.
E. Posterior view of first sacral vertebrae.
F. Dorsal view of distal extremity of left humerus.
G. Dorsal view of proximal extremity of left humerus.

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PROCEEDINGS

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A REVIEW OF REICHENBACH'S GENERA SIPTORNIS AND CRANIOLEUCA, WITH DESCRIPTIONS OF NEW ALLIED GENERA AND A SUBGENUS.

BY CHARLES B. CORY.

The species included in the Genus Siptornis Reichenbach as recognized by Sclater* and Sharpe† and later by Brabourne and Chubb‡ apparently represent five genera and at least one subgenus, the distinguishing characters of which may be briefly described as follows:

A. Tail feathers rounded at ends or abruptly pointed (not attenuated terminally and sharply pointed).

a. Size small; tail graduated and much shorter than wing (about ¾); hallux (without claw) longer than outer toe (without claw); wing about 4 times length of tarsus. *Siptornis* Reichenbach. (Type *Siptornis flammulata* Reichenbach)—not *Sittasomus flammulatus* Lesson§ and not *Siptornis flammulata* Jardine (*Synallaxis striaticollis* Lafresnaye.)

b. Size variable; tail evenly graduated with tail feathers either blunt, rounded or abruptly pointed (not attenuated terminally and not with most of the feathers sharply pointed); tail varying from slightly shorter than wing (*albiceps*) to much longer than wing (*sordida*, etc.); wing from about 3½ times length of tarsus (*curtata*, etc.) to about 3 times length of tarsus (*humilis, modesta*, etc.), or decidedly more than 3 times length of tarsus (*erythrops, subcristata*, etc.); hallux (without claw) longer than outer toe (without claw) (*albiceps, patagonica*, etc.), or about equal to outer toes (*vulpina*, etc.), or shorter (as in most

* Cat. Bds. Brit. Mus., XV, 1890, p. 58.

† Hand-list Bds., iii, 1901, p. 58.

‡ Birds South Am., I, 1912, p. 332.

§ The type of *Sittasomus flammulatus* Lesson is a young specimen of *Glyphorhynchus cuneatus cuneatus* (Lichtenstein) (*cf.* Pucheran, Rev. Mag. Zool., 1853, p. 489; Menegaux and Hellmayr, Mém. Soc. d'Hist. Nat. d'Autun, XIX, 1906, p. 97).

forms); nasal operculum largely covered by feathers (*sordida*, etc.) or much more exposed (*erythrops*, *subcristata*, etc.).

Cranioleuca Reichenbach.*

(Type *Snyallaxis albiceps* d'Orbigny and Lafresnaye.)

c. Tail long, strongly and evenly graduated† and from 1½ times length of wing to nearly twice length of wing; tail feathers slightly narrowed terminally, the ends blunt not sharply pointed; wing about 3 times length of tarsus; frontal feathers stiffened and sharply pointed; hallux (without claw) shorter than outer toe (without claw).

Pseudosiptornis, gen. nov.

(Type *Siptornis ottonis* Berlepsch.)

d. Tail long, unevenly graduated; tail feathers blunt, the three middle pairs gently graduated, the fourth pair (from outside) at least ⅞ as long as middle pair, and first, second and third pair abruptly and strongly graduated; wing about 3¼ times length of tarsus; tail about 1½ times length of wing; hallux (without claw) shorter than outer toe (without claw) **Siptornopsis**, gen. nov.

(Type *Siptornis hypochondriacus* Salvin.)

B. Tail feathers decidedly attenuated terminally and most of the feathers sharply pointed; tarsus 1-3 or more length of wing; plumage on upper parts or under parts or both conspicuously streaked

Siptornoides, gen. nov.

(Type *Siptornis flammulata* Jardine.)

a. Plumage streaked above and below, general plumage dark streaked with white or whitish. *Siptornoides* (typica).

b. Upper plumage tawny or buffy streaked with black; under parts largely or entirely without streaks **Eusiptornoides**, subgen. nov.

(Type *Synallaxis anthoides* King.)

The measurements of wing, tail and tarsus of the species and subspecies belonging to the above genera and subgenera are as follows.‡ An asterisk before a name indicates I have not seen specimens and that it is not represented in the British Museum.

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* I am unable to find any constant characters to distinguish the Genera *Asthenes* Reichenbach and *Acrorchilus* Ridgway from *Cranioleuca*. In the large number of specimens examined I find considerable variation in the shape of the culmen and also in the extent of the feathering which in some species nearly covers the nasal operculum and in others leaves it much more exposed, but several species appear to be intermediate so far as this character is concerned. The same conditions may be said to obtain regarding the relative length of wing and tarsus, and that of the hallux and outer toe, which vary in combination in different species to such an extent that their diagnostic value as distinguishing generic characters are practically lost. The advisability of recognizing several subgenera in this group based on color characters in connection with one or more of the above mentioned structural characters remains to be determined, but to my mind little advantage would be gained.

† Tail measurements of *Pseudosiptornis ottonis* (Berlepsch), cotype from Anta, Cuzco, Peru (No. 99163, American Museum of Natural History, New York)—outer pair rectrices 40 mm.; 2d pair 55; 3d pair 70; 4th pair 85; 5th pair 100; middle pair 115 mm.

‡ I am greatly indebted to my friend Mr. Charles Chubb for measurements of a number of type specimens, and others in the British Museum.

	Wing	Tarsus	Tail
Siptornis striaticollis (Lafresnaye) monotypic	66	16½	50
Cranioleuca albiceps (d'Orbigny and Lafresnaye)	66	20½	64
Cranioleuca albicapilla (Cabanis)	78	25	72
Cranioleuca vulpina vulpina (Reichenbach)	68	22	72†
Cranioleuca vulpina alopecias (Pelzeln)	....	....	....
Cranioleuca pallida (Wied)	55	17	53
Cranioleuca gutturata (Lafresnaye and d'Orbigny)	....	....	....
Cranioleuca mulleri (Hellmayr)	....	....	....
Cranioleuca antisiensis antisiensis (Sclater)	65	18	70
Cranioleuca antisiensis cisandina (Taczanowski)	70	18	72
Cranioleuca furcata (Taczanowski)	....	....	....
Cranioleuca hellmayri (Bangs)	64	18	68
Cranioleuca baroni (Salvin)	81	15	81
Cranioleuca curtata curtata (Sclater)	64	18	61
Cranioleuca curtata debilis (Berlepsch and Stolzmann)	67	18	69
Cranioleuca erythrops erythrops (Sclater)	66	18	71
Cranioleuca erythrops griseigularis (Ridgway)	67	18½	72
Cranioleuca erythrops rufigenis (Lawrence)	66	18	73
Cranioleuca subcristata (Sclater)	67	17½	70
Cranioleuca ruticilla (Cabanis and Heine)	....	....	....
Cranioleuca striaticeps striaticeps (d'Orbigny and Lafresnaye)	64	18½	69
Cranioleuca striaticeps heterocerca (Berlepsch)	65	18½	68
Cranioleuca humicola humicola (Kittlitz)	64	21	73
Cranioleuca humicola steinbachi (Hartert and Venturi)	63	21	74
Cranioleuca d'orbignyii (Reichenbach)	62	22	72
Cranioleuca modesta modesta (Eyton)	64	21	68
Cranioleuca modesta sajamae (Berlepsch)	70	22½	76
Cranioleuca modesta rostrata (Berlepsch)	68	22½	70
Cranioleuca humilis humilis (Cabanis)	74	24	79
Cranioleuca humilis marayniocensis (Berlepsch and Stolzmann	67	22	68
Cranioleuca humilis robusta (Berlepsch)	76	25	73
Cranioleuca arequipae (Sclater and Salvin)	67	24	68
**Cranioleuca pudibunda* (Sclater)	....	....	....
Cranioleuca neglecta Cory	62	22	83
**Cranioleuca hilereti* (Oustalet)	....	....	....
**Cranioleuca heterura* (Berlepsch)	....	....	....
Cranioleuca sordida sordida (Lesson)	66	21	84
Cranioleuca sordida affinis (Berlepsch)	67	21	86
Cranioleuca sordida flavogularis (Gould)	66	21½	84
Cranioleuca baeri (Berlepsch)	63	21	65
Cranioleuca patagonica (d'Orbigny)	59	21	67
Cranioleuca sulphurifera (Burmeister)	56	18	70
Cranioleuca wyatti (Sclater and Salvin)	58	20	67

† From specimens in the British Museum.

	Wing	Tarsus	Tail
**Cranioleuca graminicola* (Sclater)†	----	----	----
Pseudosiptornis ottonis (Berlepsch) monotypic	60	21	95–110
Siptornopsis hypochondriacus (Salvin) monotypic	65	20	93
Siptornoides flammulata flammulata (Jardine)	63	24½	74
Siptornoides flammulata multostriata (Sclater)	65	25	75
Siptornoides flammulata quindiana (Chapman)	63	25	75
Siptornoides flammulata taczanowskii (Berlepsch and Stolzmann)	63	24	87
Siptornoides flammulata maculicauda (Berlepsch)	----	----	----
**Siptornoides virgata* (Sclater)	----	----	----
Siptornoides (*Eusiptornoides*) *anthoides* (King)	70	20	76
Siptornoides (*Eusiptornoides*) *hudsoni* (Sclater)	75	22	84
Siptornoides (*Eusiptornoides*) *lilloi* (Oustalet)	76	24	85
Siptornoides (*Eusiptornoides*) *punensis* (Berlepsch and Stolzmann)	76	25	90
Siptornoides (*Eusiptornoides*) *maluroides* (d'Orbigny and Lafresnaye)	53	16½	63

KEY TO THE SPECIES AND SUBSPECIES BELONGING TO THE ALLIED GENERA SIPTORNIS, CRANIOLEUCA, PSEUDOSIPTORNIS, SIPTORNOPSIS, AND SIPTORNOIDES (ADULT MALES) WITH TYPE LOCALITIES.

A. Back not distinctly streaked.

a. Cap and more or less of upper parts (at least upper back) nearly the same color.

a¹. Cap and at least upper back rufous or rufous chestnut or rufous brown.

a². Under parts plain (not mottled or spotted).

1. A whitish superciliary stripe
Cranioleuca vulpina vulpina (Pelzeln).
(Rio Claro, Goyaz, Brazil.)

2. Male similar, but female lacks the rufescent upper back
Cranioleuca vulpina alopecias (Pelzeln).
(Rio Branco, N. Brazil.)

b². Under parts more or less mottled, the feathers tipped with dusky.

1. Front of crown streaked; sides of body reddish brown
Cranioleuca mulleri (Hellmayr).
(Mexiana I., N. E. Brazil.)

b¹. Cap (ground color) and upper parts, nearly the same color (either brown, or olive brown, or buffy brown or grayish).

b². Whole tail plain (tail feathers uniform, not bicolored nor distinctly marked with brown or black on some feathers).

b³. Crown streaked.

b. Underparts olive grayish or buffy grayish.

1. Primaries edged with rufous
Cranioleuca subcristata (Sclater).
(Caracas, Venezuela.)

† I have not seen this species and it may not belong to this genus.

2. Primaries not edged with rufous
Cranioleuca ruticilla (Cabanis and Heine).
(Buenos Aires, Argentina.)

c⁴. Under parts white, whitish or grayish white.

1. Size larger; middle rectrices uniform to the ends
Cranioleuca striaticeps striaticeps (d'Orbigny and Lafresnaye).
(Bolivia.)

2. Size smaller; middle rectrices with inner webs tinged with dusky and dusky ends
Cranioleuca striaticeps heterocerca (Berlepsch).
(Cosquin, Cordova, Argentina.)

c³. Crown not streaked.

c. Flanks streaked with black or blackish.

1. Under parts white or whitish; wings blackish bordered with mouse color *Siptornopsis hypochondriacus* (Salvin)
(Melea, Cajabamba, Peru.)

d⁴. Flanks not streaked with black.

1. Edges of wing coverts rufous; basal part of outer webs of remiges pale rufous forming a band; a sulphur yellow throat spot (adult); no throat spot; under parts more or less tinged with ochraceous or pale tawny; crown and back buffy brown (immature) *Cranioleuca sulphurifera* (Burmeister).
(Buenos Aires, Argentina.)

2. Wing coverts and tail dark rufous; under parts ochraceous; crown and back tinged with olivaceous (immature); cap rufous (adult) *Cranioleuca pallida* (Wied).
(Campos Geraes, S. E. Brazil.)

c². Some tail feathers (at least) bicolored, marked or bordered with differently colored ends or bases.

c. Throat white, the feathers with black or brown points or spots; breast (at least) with narrow shaft streaks (no colored throat patch).

1. Wing coverts, flanks and lower abdomen rufous brown; a white superciliary stripe; tail dark brown, the outer webs of the two outer feathers largely rufous brown
Cranioleuca humicola humicola (Kittlitz).
(Valparaiso, Chili.)

2. Similar but wing coverts, flanks and lower abdomen more rusty brown; superciliary stripe but slightly indicated or absent
Cranioleuca humicola steinbachi (Hartert and Venturi).
(Cachi, Prov. Salta, Argentina.)

d³. Throat (in adult) with patch or spot of rufous, chestnut or tawny; throat spot absent or faint in immature.

d⁴. Tail more than 90 mm. long.

1. Tail feathers rufous shading to dusky rufous towards the ends; crown and back brown; forehead rufous; throat spot (in adult) rufous
Pseudosiptornis ottonis (Berlepsch).
(Cuzco, Peru.)

e⁴. Tail less than 90 mm. long.

e⁵. Rump strongly rufous.

1. Outer tail feather only with inner web black and outer web rufous, rest of tail feathers black; outer secondaries edged with rufous; basal part of secondaries washed with rufous forming a band; throat spot rufous; under parts not milky white

Cranioleuca d'Orbignyii (Reichenbach).
(La Paz, Bolivia.)

2. At least two outer pairs of tail feathers entirely rufous; outer secondaries not edged with rufous and no rufous basal band on secondaries; throat spot rufous; under parts milky white

Cranioleuca arequipae (Sclater and Salvin).
(Arequipa, S. W. Peru.)

f⁵. Rump not strongly rufous.

f⁶. At least outer tail feather uniform, both webs the same color to the base.

f⁷. Outer tail feather only uniform rufous brown, rufous or pale brown.

1. Outer tail feather brown, rest of tail dark brown, the feathers more or less bordered with pale brown; a white superciliary stripe; throat whitish, more or less indistinctly streaked with brownish

Cranioleuca humilis (Cabanis).
(Junin, Peru.)

2. Outer tail feathers dark rufous, rest of tail dark rufous with blackish on inner webs; throat spot (in adult) tawny rufous

Cranioleuca pudibunda (Sclater).
(Obraillo, C. Peru.)

g⁷. Two outer pairs of tail feathers uniform rufous, rest blackish or blackish marked with rufous.

1. Third tail feather with some blackish on inner web; tail relatively short (about 68 mm.)

Cranioleuca baeri (Berlepsch).
(Cosquin, Cordova, Argentina.)

h⁷. Three outer pairs of tail feathers uniform rufous or brownish rufous.

h⁸. Upper tail coverts dark rufous.

1. Upper parts brown; rump slightly brownish rufous; under parts, sides and flanks brownish ashy; large throat spot deep rufous chestnut

Cranioleuca neglecta (Cory).*
(Macate, Peru.)

* This may prove to be the same as *pudibunda*, but the throat spot and coloration of the tail feathers is quite different from the description of that species, as given by Sclater and Taczanowski.

i[8]. Upper tail coverts brownish like back and rump.

1. Upper parts pale brown (between wood brown and buffy brown); throat spot (in adult) tawny rufous *Cranioleuca sordida sordida* (Lesson). (Chili.)

2. Similar but upper parts darker (more fuscous brown); throat spot similar
Cranioleuca sordida flavogularis (Gould). (Santa Cruz, Patagonia.)

3. Similar but upper parts still darker; under parts whitish gray; throat spot rufous chestnut
Cranioleuca sordida affinis (Berlepsch). (Las Vasques, Tucuman, Argentina.)

i[7]. Four outer pairs of tail feathers uniform rufous or brownish rufous.

1. Two middle pairs of tail feathers dusky brown (at least on inner webs); tail feathers pointed; throat spot tawny; under parts tinged with tawny
Cranioleuca heterura (Oustalet).* (Tucuman, Argentina.)

2. Four outer tail feathers uniform brownish rufous; two middle pairs with more or less blackish; tail feathers not sharply pointed
Cranioleuca pudibunda (Sclater).† (Obraillo, C. Peru.)

j[6]. Outer tail feather more or less bicolor (not uniformly colored to base).

j[7]. Middle pair of tail feathers with outer webs rufous, inner webs blackish.

1. Outer tail feather with at least basal part of inner web dusky brown or blackish; all tail feathers including middle pair with more or less blackish and rufous; throat spot tawny rufous
Cranioleuca modesta modesta (Eyton). (Chili.)

2. Similar but upper parts sandy earth brown; wings and tail longer
Cranioleuca modesta sajamae (Berlepsch). (Esperanza, Sajama, W. Bolivia).

3. Similar but throat spot (in adult) chestnut rufous; bill longer (about 15 mm.)
Cranioleuca modesta rostrata (Berlepsch). (Vacas, E. Bolivia.)

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* I have not seen this species, which may belong to a different genus.

† I have not seen this species, which is described by Sclater (and also Taczanowski) as having the two middle pairs of rectrices only marked with blackish on inner webs, the rest of the tail feathers uniform. Berlepsch, however (J. f. O., 1901, p. 93 in text) states that *pudibunda* has the 2d to 4th pair blackish on inner webs. As no specimens are available, I have been forced to include it in both sections.

k[7]. Middle pair of tail feathers uniform pale tawny.
1. Throat spot (in adult) rufous
Cranioleuca hilereti (Oustalet).
(Tucuman, Argentina.)

c[3]. Throat uniform pale grayish (no bright colored throat spot in adult.
1. Outer tail feather with outer web rufous, rest of tail feathers blackish; upper parts mouse brown or grayish earthy brown; under parts grayish; under wing coverts ochraceous cinnamon; lower belly and flanks buffy ochraceous
Cranioleuca patagonica (d'Orbigny).
(Rio Negro, Patagonia.)

b. Color of cap and back very different.
b[1]. Cap, wings (externally) and tail rufous, chestnut or rusty brownish.
b[2]. Breast not distinctly streaked or spotted.
b[3]. Face and sides of head not rufous or cinnamon.
b[4]. With a distinct superciliary stripe.
b[5]. Cap streaked with black.
1. Similar to *antisiensis*, but crown streaked with black
Cranioleuca hellmayri (Bangs).
(Santa Marta, Colombia.)

c[5]. Cap not streaked with black.
c. Smaller, wing less than 62.
1. Under parts ochraceous; back brownish; superciliary stripe white or whitish
Cranioleuca pallida (Wied).
(Campos Geraes, S. E. Brazil.)

d[6]. Larger, wing more than 60.
1. Under parts ochraceous; back olivaceous; superciliary stripe tawny
Cranioleuca furcata (Taczanowski).
(Chirimoto, N. E. Peru.)
2. Under parts pale grayish; upper parts brown; lores and superciliary stripe whitish; wing less than 70 mm. *Cranioleuca antisiensis antisiensis* (Sclater).
(Cuenca, Ecuador.)
3. Similar but superciliaries purer white and ear coverts more grayish; under parts somewhat pale
Cranioleuca antisiensis cisandina (Taczanowski).
(Huambo, N. Peru.)
4. Upper parts grayish mouse color; throat white; wing more than 70 mm., otherwise approaches *antisiensis*, but larger *Cranioleuca baroni* (Salvin).
(Huamachuco, E. Central Peru.)

c[4]. Without a distinct superciliary stripe.
1. Upper parts brown tinged with rufous; crown and forehead nearly uniform in color; throat whitish
Cranioleuca curtata curtata (Sclater).
(Bogota, Colombia.)

2. Similar but forehead brownish olive; size somewhat smaller
Cranioleuca curtata debilis (Berlepsch and Stolzmann).
(Marcapata, S. E. Peru.)

c^3. Face and sides of head rufous or cinnamon.

cc. Middle pair of rectrices russet brown (different color from rest of tail).

1. *Cranioleuca erythrops erythrops* (Sclater).
(Pallatanga, Ecuador.)

d^4. Middle pair of rectrices cinnamon rufous like rest of tail.

1. Chest grayish; rufous of crown extending to nape
Cranioleuca erythrops griseigularis (Ridgway).
(San Antonio, Rio Cali, N. W. Colombia.)

2. Chest light buffy olive; rufous of crown not extending to nape *Cranioleuca erythrops rufigenis* (Lawrence).
(Costa Rica.)

c^2. Breast distinctly streaked or with irregular spots.

1. Back reddish brown; crown somewhat darker; breast brownish olivaceous with whitish streaks; superciliary stripe white; belly plain *Siptornis striaticollis* (Lafresnaye).
(Bogota.)

2. Back brown; breast pale grayish brown marked with black points or spots to the feathers, belly with obscure blackish bars *Cranioleuca gutturata* (Lafresnaye).
(Yuracares, Bolivia.)

c^1. Cap white or brownish white (very different from back); tail and more or less of wing coverts rufous.

1. Upper back rufous; lower back brownish; under parts olivaceous brown; size smaller
Cranioleuca albiceps (d'Orbigny and Lafresnaye).
(Sica-Sica, Bolivia.)

2. Upper parts olive brown; cap brownish white; throat and foreneck whitish; rest of under parts pale earthy brown
Cranioleuca albicapilla (Cabanis).
(Maraynioc, Peru.)

B. Back distinctly streaked.

a. Under parts (at least below the throat) not streaked.

a^1. Upper parts dark olive brown streaked with blackish.

a^2. Outer tail feathers uniform (plain rufous or brownish rufous); under parts not buffy white.

1. Three outer tail feathers plain rufous; size smaller, wing about 60 mm.; throat spot rufous; breast and sides more or less tinged with brownish olivaceous
Cranioleuca wyatti (Sclater and Salvin).
(Santa Marta, Colombia.)

2. Two outer tail feathers uniform brownish rufous; third tail feather with blackish border on inner web; under parts rufous cinnamon; size larger, wing about 72 mm.
Cranioleuca? graminicola (Sclater).*
(Near Junin, Peru.)

b². Outer tail feathers largely dark brown (not uniform rufous or brownish rufous); under parts buffy white.

1. Bill shorter; exposed edges of basal part of inner primaries not rufous; inner tail feathers blacker and the pale edging not so pronounced; throat patch larger; darker rufous wing (about 70 mm.) *Cranioleuca humilis humilis* (Cabanis).
(Junin, Peru.)

2. Bill longer; exposed edge of basal part of inner primaries rufous; pale edging on inner tail feathers brighter and more conspicuous; throat patch smaller; paler rufous wing (about 67)
Cranioleuca humilis marayniocensis (Berlepsch and Stolzmann).
(Maraynioc, C. Peru.)

3. Similar but larger; wing about 74 mm.
Cranioleuca humilis robusta (Berlepsch).
(Iquico, W. Bolivia.)

b¹. Upper parts olive buffy or olivaceous tawny streaked with blackish.

b². Cap plain bright rufous; size smaller, wing less than 55 mm.; tail attenuated and sharply pointed
Siptornoides (*Eusiptornoides maluroides* (d'Orbigny and Lafresnaye).
(Buenos Aires, Argentina.)

c². Cap not plain rufous; whole crown streaked; size larger, wing much more than 60 mm.; tail attenuated and pointed.

c³. Superciliary stripe whitish or buffy white.

1. Throat spot rufous;† flanks and under tail coverts not distinctly streaked; smaller, wing 70 mm. or less
Siptornoides (*Eusiptornoides*) *anthoides* (King).
(Straits of Magellan.)

2. Throat spot yellowish or rufous; flanks and under tail coverts more or less streaked; wing about 74 mm.
Siptornoides (*Eusiptornoides*) *hudsoni* (Sclater).
(Conchitas, Buenos Aires, Argentina.)

3. Throat spot rufous; lower abdomen and flanks uniform fawn color without streaks; size of *hudsoni*
Siptornoides (*Eusiptornoides*) *lilloi* (Oustalet).‡
(Tucuman, Argentina).

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* I have not seen *graminicola* Sclater and it may belong to a different genus.

† The gular patch and general color of the throat is very variable and may be due to age. In this connection Mr. Charles Chubb writes me as follows: "The colour of the throat is a variable character which occurs in both male and female being sometimes white dotted with black, at others lemon or sulphur yellow, and many (at all seasons of the year) cinnamon rufous."

‡ I have not seen specimens of either *lilloi* or *punensis*.

d^3. Superciliary stripe rufescent.

1. Superciliary stripe and middle of abdomen rufescent
Siptornoides (*Eusiptornoides*) *punensis* (Berlepsch and Stolzmann). (Puno, S. E. Peru.)

b. Both upper parts and under parts streaked.

b^1. Plumage dark streaked with white or whitish.

b^2. Size larger, wing more than 68 mm.

1. Lower back and rump not streaked; middle breast white
Siptornoides virgata (Sclater). (Junin, Peru.)

c^2. Size smaller, wing less than 68 mm.

1. White streaks on under parts much wider, upper throat rufous tawny *Siptornoides flammulata flammulata* (Jardine). (Andes of Ecuador.)
2. Similar but color of throat extending to upper margin of breast (in adult); whitish streaks on back narrower
Siptornoides flammulata taczanowskii (Berlepsch and Stolzmann). (Maraynioc, C. Peru.)
3. Similar but no rufous tawny on throat; forehead more tinged with rusty; stripes on breast and sides more obscure; blackish marking on tail irregular
Siptornoides flammulata maculicauda (Berlepsch).* (Iquico, W. Bolivia.)
4. Whitish streaking on under parts much narrower; throat spot on upper throat deep rusty rufous (in adult)
Siptornoides flammulata multistriata (Sclater). (Bogota.)
5. Whole throat (in adult) ochraceous buff or buffy rufous; sides of head more or less buffy rufous
Siptornoides flammulata quindiana (Chapman). (Paramo de Santa Isabel, Central Andes, Colombia.)

c^1. Plumage tawny or buffy; upper parts streaked with blackish; breast and sides streaked with dark brown or dusky.

1. Throat spot tawny rufous (adult?) or upper throat plain whitish (immature?)† *Siptornoides* (*Eusiptornoides*) *hudsoni* (Sclater). (Conchitas, Buenos Aires, Argentina.)

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* No specimens seen.

† See foot note (*antea*) regarding the variation in coloration of throat in this species.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

A NEW COTTON RAT FROM ARIZONA.

BY A. BRAZIER HOWELL.

In my collection are two cotton rats from the vicinity of Fort Lowell, Arizona, which could not be satisfactorily identified with the material at hand. Accordingly, I sent one of them to the Bureau of Biological Survey for determination, and Dr. Jackson, who examined it, informed me that it probably belonged to an undescribed race. D. R. Dickey generously loaned me two skins which he had from the same section, and with ten specimens of various Arizona races kindly furnished me by the Biological Survey, through Mr. E. W. Nelson, and a good series of *Sigmodon eremicus* in my own collection, the differences appear to be entirely sufficient for me to designate a new form which may be known as

Sigmodon hispidus cienegae.

CIENEGA COTTON RAT.

Type from Bullock's Ranch, four miles east of Fort Lowell, Pima County, Arizona. No. 1531, collection of A. B. Howell; collected by L. M. Huey; January 4, 1916.

Geographic distribution.—Probably the small and widely scattered cienegas and grassy damp spots of the upper Santa Cruz River system.

General characters.—Closest to *Sigmodon h. confinis*, but skull with more inflated braincase, larger bullae, and rostrum shorter and wider. Tail slightly shorter than *eremicus*, and foot considerably longer than that form or *confinis*.

Color.—Darker and slightly browner than *eremicus*, but hardly comparable in this respect with specimens of *confinis* or *arizonae*, as all of the latter are summer skins.

Skull.—In comparison with *confinis*, the skull differs in having slightly larger molars, bullae larger and more globular, inter-orbital width greater, braincase more inflated, rostrum shorter, wider and heavier in general. From

eremicus it differs in having greater inter-orbital width, larger bullae, and shorter, heavier rostrum.

Measurements.—Type: Total length, 307; tail, 129.5; hind foot, 35.5. Averages of series (type, no. 318 ♀ coll. A. B. H., nos. 6D ♂ and DX19 ♂ coll. D. R. Dickey): Total length, 261.5; tail, 110; hind foot, 34.

Remarks.—Comparing the ages of the skulls with their sizes, I judge that *cienegae* is a larger animal than *confinis*. Although sign was common at two small spots near the type locality, the animals were very shy, and continued trapping by L. M. Huey and myself during the greater part of the winter, resulted in the capture of but five individuals, three of which were obtained accidentally.

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PROCEEDINGS

OF THE

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AN AMERICAN FLOUNDER, LIMANDA BEANII, REFERRED TO THE GENUS POECILOPSETTA.

BY CARL L. HUBBS.

In 1881 Goode described, under the name of *Limanda Beanii*, a small flounder which the United States Fish Commission Steamer *Fish Hawk* had dredged in deep water off the southern coast of New England. Subsequently the species has been recorded from the Gulf of Mexico.

Although Goode noted some of the differences which widely separate this form from the typical species of *Limanda*, no author has assigned it to its true position in the system. It is clearly referable, however, to the deep-water genus *Poecilopsetta* Günther, hitherto recorded only from the Indo-Pacific region; it agrees in all respects with the following characterization of that genus.

GENUS **Poecilopsetta** Günther.

Eyes dextral, the margin of the upper entering the dorsal profile; interorbital space very narrow; head short; body strongly compressed, varying from elongate to rather robust; dorsal fin composed of about 60 rays, extending from a short distance behind vertical through pupil nearly to caudal base, of rather even height throughout; anal fin similar, of about 50 rays; anal spine weak; caudal rounded; pectoral short, that of the eyed side with 7 to 10 rays; pelvics short, subequal, but somewhat asymmetric, approaching those of the Psettinae, the one on the eyed side being slightly anterior to the left one, and nearer the ventral ridge; each pelvic fin of 6 rays; scales moderate in size or small, weakly ctenoid on eyed side, cycloid on blind side; interorbital, snout and jaws naked; lateral line with a large, flat-topped arch on eyed side, *obsolete on blind side;* mouth narrow, nearly symmetric, and rather small; teeth villiform, in bands, present on jaws only, better devel-

oped on the blind than on the eyed side; gill-rakers rather short, sharp and smooth; anus nearly on ventral ridge.

Five other species of *Poecilopsetta* are known (*P. maculosa*, *praelonga*, *plinthus*, *colorata* and *hawaiiensis*). *Poecilopsetta beanii* is a more slender fish than any of these except *P. praelonga*, from which it appears to differ in the narrower bands of teeth on the jaws.

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NOTES ON GARGAPHIA TILIAE WALSH, THE LINDEN LACE-BUG.

BY HARRY B. WEISS.

The following notes are the results of observations made during the summers of 1918 and 1919 at Uhlerstown, Pa., where the lace-bug *Gargaphia tiliae* Walsh was fairly abundant on lindens growing along the canal.

During the last of May and first of June adults appear and deposit eggs. The adult feeding at this time is quite scattered and shows as numerous white spots on the upper leaf surfaces. The eggs are inserted in the lower leaf surface and occur in clusters of from 60 or less to 300. Their bases are inserted in the tissue and the eggs project at right angles to the lower surface although many lean in all directions. The upper leaf surface just above the egg mass is usually discolored and brown.

After hatching the whitish or brownish-white nymphs feed in compact clusters on the lower leaf surfaces which results in discolored, light, somewhat circular areas on the upper surfaces. Later these areas become brown and dead. The feeding takes place on any part of the leaf and does not appear to be confined to tissue more or less near the midrib as is the case with several species of *Corythucha*. The nymphs are always found feeding in groups and do not scatter as they become older.

During the incubation period of the egg, a female lace-bug is always in attendance and each colony of nymphs usually has a female watching over it until the members are full grown. Fink[1] has observed a similar occurrence in connection with the eggplant lace-bug, *Gargaphia solani* Heid., and states that "when migrating from one leaf to another the female adult usually directs the way and with her long antennae keeps the nymphs together or rebukes any straggler or deserter." Unfortunately, no migrations of *G. tiliae* were observed, but it is quite probable that the adult acts in a similar way.

The eggs require about a week for hatching and the combined nymphal stages about three weeks, making a month from egg to adult. Adults of the

[1] Fink, D. E., The Eggplant Lace-Bug, Bul. 239, U. S. Dept. Agric. Bur. Ent.

first brood appear during the last of June and first part of July after which eggs are again laid, the adults of this second generation hibernating and appearing the following spring.

Gargaphia tiliae was described in 1864 by Walsh. Van Duzee in his Catalogue of Hemiptera gives the following references to the species:

Walsh, Proc. Ent. Soc. Phil. III, p. 408, 1864.
Uhler, Check list, p. 22, 1886.
Provancher, Pet. Faune Ent. Can. III, p. 159, 1887.
Bergroth, Revue d'Ent. XI, p. 264, 1892.
Van Duzee, Bul. Buf. Soc. Nat. Sci. V, p. 181, 1894.
Gillette & Baker, Hemip. Colo. p. 57, 1895.
Bueno, Jl. N. Y. Ent. Soc. XVIII, p. 31, 1910.
Smith, Cat. Ins. N. J. ed., 3, p. 149, 1910.
Osborn & Drake, Ohio St. Univ. Bul. XX, p. 234, 1916.
syn. *fasciata* Stal. Enum. Hemip. III, p. 125, 1873.
Wirtner, Ann. Carn. Mus. III, p. 202, 1904.
Smith, Cat. Ins. N. J. ed. 3, p. 149, 1910.
Localities, N. Y., N. J., Pa., Va., Ohio, Ill., Kan., Colo.

To the above references to the species can be added the following:
Drake, Ent. News, XXVIII, p. 227, 1917.
Parshley, Fauna New Eng. Hem. Heter., Bost. Soc. Nat. His. VII, 14, p. 56, 1917.

This latter reference adds New Hampshire, Massachusetts and Connecticut to the list of localities.

Egg. Length 0.48 mm. Width 0.18 mm. Suboval, one side more convex than other; basal part acute with rounded end, slightly constricted where inserted in leaf tissue; widest across basal half; extremity of apical end truncate with rim-like collar and central cone-shaped nipple projecting only slightly or not at all; translucent except for apical third which is covered with a light brown varnish-like material.

First Stage Nymph. Length 0.45 mm. Elliptical; whitish except articulations of antennal segments, dorsal surfaces of thorax and abdomen, and outer surfaces of legs which are light brown (some specimens are almost entirely white); antennae two-thirds length of body bearing stiff hairs; eyes lateral, consisting of five, distinct, red ommatidia; head, thorax and abdomen bearing minute, dorsal tubercles each tipped with a hair; legs long; rostrum brownish at tip, extending beyond bases of third pair of legs.

Second Stage Nymph. Length 0.75 mm. Similar to preceding stage in color, shape and markings; some specimens are entirely light brown; antennae almost three-fourths length of body; tubercles becoming spine-like and similar in arrangement to those of third stage nymph.

Third Stage Nymph. Length 1.25 mm. Antennae two-thirds to three-fourths length of body; body oval; antennae, dorsal surfaces of head and thorax, and median, dorsal portion of abdomen tinged with brown, remainder white (some specimens whitish except for last antennal segment and spines on head, thorax and median, dorsal portion of abdomen which are brown; articulation of femur and tibia and tip of tarsus brownish; spines on

head, pro- and mesothorax and median, dorsal portion of abdomen mostly dark, remainder of spines whitish; antennae and legs bearing stiff hairs; rostrum extending slightly beyond bases of third pair of legs. Head bears a pair of separated spines just above and between antennae, behind this pair is a single, larger, median spine; posterior to this one and close to anterior margin of prothorax is a pair of large, separated spines. Prothorax bears a pair of median, separated spines and one spine and several spine-like hairs on each lateral edge. Mesothorax bears a pair of median, dorsal, separated spines, and one spine and several spine-like hairs on each lateral edge. Metathorax bears a dorsal, median pair of smaller, separated spines and a minute one on each lateral edge. Median, dorsal, separated pairs of spines on first and second and single, median, dorsal spines on fifth, sixth and eighth abdominal segments. Lateral margins of each abdominal segment beginning with the second bear a single spine. Head, thoracic and median abdominal spines largest; all spines arise from tuberculate bases and bear one or two hairs at tip and several at sides. Wing pads indicated by slight enlargements of lateral, thoracic margins.

Fourth Stage Nymph. Length 1.4 mm. Oval; color and markings similar to those of fifth stage. Antennae as long as body. Lobes of pro- and mesothorax more pronounced. Lobes of mesothorax rounded and reaching second abdominal segment. Rostrum extending to just beyond bases of second pair of legs. Armature similar to that of third stage except for the following additions,—anterior to large spine on lateral edge of prothorax are several minute spines; anterior to large spine on lateral edge of mesothorax are several minute spines and hairs. Anterior to median, dorsal pair on prothorax and close to anterior edge of prothorax is a pair of minute spines with united bases.

Fifth Stage Nymph. Length 2.1 mm. Elongate-oval; eyes prominent, lateral, reddish; antennae almost as long as body, first segment two and one-half times as long as second, third segment longest, fourth somewhat swollen. Wing pads extending to sixth abdominal segment. Rostrum extending to between bases of second pair of legs. Base of rostrum bears spine-like hairs. Head bears a pair of separated spines just above and between antennae, a single, median spine posterior to this pair and a pair of separated spines posterior to this one and close to anterior edge of prothorax. Prothorax bears pair small, median spines with united bases just posterior to anterior edge; posterior to this pair is a prominent, median separated pair; posterior, lateral edge bears a prominent spine with a smaller spine and several hairs anterior to it. Mesothorax bears a pair of prominent, median spines separated by the posterior part of the prothorax which is produced triangularly. Wing pad of mesothorax bears a large spine on posterior, lateral edge; anterior to this spine are two smaller spines and several hairs. Metathorax bears dorsal, median pair of separated spines. Separated, median spines on dorsal surface of first and second abdominal segments. Single, median, dorsal spines on abdominal segments five, six and eight. Lateral edges of abdominal segments beginning with fourth bear single spines. Lateral spines on last abdominal segment are short and blunt. All spines arising from tuberculate bases and bearing one or two hairs at tip

and several on sides. Color.—First and second antennal segments whitish or tinged with brown, distal third of third segment light, remainder of third and all of fourth segment brown. Head light except that portion lateral to the posterior pair of spines which is dark brown. Prothorax whitish except for posterior half of dorsal surface which is brownish, this dark area is bisected by a broad, median, light stripe. Two central dark areas on mesothorax on either side of a narrow, median light line broadening at its posterior end. Posterior edges of mesothoracic wing pads dark, remainder white. Median, dorsal, portion of abdominal segments three to nine, varying from light to dark brown (seventh segment sometimes white), remainder whitish. Spines on head dark. Pair dark spines arising from median light stripe on prothorax. Prominent spines on posterior lateral edges of prothoracic expansions dark, other prothoracic spines light. All large spines on mesothorax and mesothoracic wing pads dark, others light. Median dorsal spines on fifth, sixth, eighth and lateral spines on ninth abdominal segments light brown to dark brown, remaining abdominal spines whitish. Ventral surface whitish, except base and tip of rostrum and articulation of femur and tibia and tip of tarsus which are brownish.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

A NEW POCKET GOPHER FROM WESTERN WASHINGTON.

BY WALTER P. TAYLOR.

Specimens of pocket gophers collected for the Biological Survey by George G. Cantwell during the winter of 1918, six miles south of Tacoma, Pierce County, Washington, prove to represent a new subspecies of the *douglasii* group.

Thomomys douglasii tacomensis, new subspecies.

TACOMA POCKET GOPHER.

Type.—From six miles south of Tacoma, Pierce County, Washington; No. 231,096, U. S. National Museum (Biological Survey collection); ♀ young adult; collected by George G. Cantwell, December 24, 1918; original no. 857.

General characters.—Darker than any others of the pocket gophers occupying the lowlands of western Washington. Similar to *Thomomys douglasii yelmensis*, to which it appears to be most closely related, but upperparts and face darker; postauricular black area more extensive; nasals narrower anteriorly. Similar to *T. d. melanops*, but with interparietal larger.

Geographic distribution.—The typical form occurs on a prairie six miles south of Tacoma, Pierce County, Washington. Specimens from Olympia, Thurston County, and Steilacoom, Pierce County, are tentatively referred to this subspecies.

Color.—Upperparts (winter pelage) in general, cinnamon-buff or clay color, grizzled with blackish; face blackish; black postauricular area one centimeter square nearly continuous with blackish of sides of face; nose usually with white spots; whiskers, white or gray; underparts rather pale, ochraceous-buff or light buff, a trifle darker in some examples, lacking the irregular white areas observable in certain specimens of *yelmensis*.

Skull.—As in *Thomomys douglasii yelmensis*, but nasals averaging narrower anteriorly; anterior nasal openings apparently smaller; rostrum apparently more slender; cranium a little more rounded; interparietal averaging shorter and narrower.

Remarks.—The pocket gophers of the isolated prairies of western Washington show the effects of segregation. Broadly speaking, one may say that those inhabiting each prairie represent a local variant. While the characterization of each of these would be confusing, the recognition of the more obvious forms is desirable. *Thomomys douglasii douglasii* is one of these, *T. d. yelmensis* another, and *T. d. tacomensis* a third. Specimens from localities between the type locality of the present subspecies and that of *yelmensis* are of somewhat intermediate character, and might be referred to either subspecies, according to specimens now in hand. Their precise allocation must await the acquisition of additional material.

Specimens examined.—Total number 16, as follows:

Tacoma (6 miles south), Pierce County, 8; Steilacoom, Pierce County, 2; Olympia (4 miles south), Thurston County, 6.

EXTERNAL AND CRANIAL MEASUREMENTS OF *Thomomys douglasii tacomensis* AND *T. d. yelmensis.*

Species and Locality.	No. and Sex.	Total length.	Tail vertebrae.	Hind foot.	Length of skull.[1]	Width of nasals anteriorly.	Width of nasals posteriorly.	Greatest length of nasals.	Remarks.
Thomomys douglasii tacomensis									
Tacoma, Washington	231098 ♂	220	62	30	37.3	3.5	2.3	14.5	Adult, not old.
" "	231094 ♀	205	65	29	.....	3.5	2.6	13.4	Young adult.
" "	231096 ♀	218	70	30	.....	4.2	2.6	13.7	" "
" "	231097 ♀	215	65	30	37.4	4.0	2.5	.....	" "
" "	231099 ♀	212	66	30	36.6	3.9	2.5	13.6	" "
" "	231102 ♀	208	65	27	36.3	.....	2.5	13.5	" "
" "	231103 ♀	210	64	28	36.1	3.8	2.5	13.2	" "
Thomomys douglasii yelmensis.									
Tenino, Washington	$\frac{31916}{43777}$ ♂	222	68	32	38.3	5.0	2.5	14.8	Adult.
" "	$\frac{31458}{43323}$ ♂	222	63	33	38.0	5.2	2.4	14.1	"
" "	$\frac{31915}{43776}$ ♂	200	61	29	34.9	4.2	2.0	12.9	Young adult.
Rochester, Washington	231088 ♂	215	65	30	39.0	4.5	2.2	15.2	Adult.
" "	231086 ♀	210	72	29	35.6	3.9	2.4	14.2	Young adult.
" "	231087 ♀	218	66	30	38.2	4.4	2.5	14.5	Subadult.
" "	231089 ♀	210	60	30	36.8	4.2	3.0	14.4	"
" "	231093 ♀	220	62	33	38.2	4.0	2.5	14.5	"

[1] Length of skull anterior end of nasals to most posterior point on skull in the median line.

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PROCEEDINGS

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THE STATUS OF LARUS HYPERBOREUS BARROVIANUS RIDGWAY.

BY HARRY C. OBERHOLSER.

In connection with the determination of material in the Biological Survey collection, the writer has recently had occasion to review the claims of *Larus hyperboreus barrovianus* Ridgway to recognition as a subspecies. Although Dr. J. Dwight questions[1] its validity, a careful reexamination of the material and the other evidence in this case shows that this race is fully as good as very many other subspecies of North American birds that are currently accepted without demur. A few further comments on this case may not be out of place at this time.

Of course, if our subspecies must be forms in which each individual bird is constantly different from all those of every other related form, we should need to expunge from our lists not only the majority of subspecies, but even some perfectly distinct species. Such, however, is fortunately not the criterion applied by most modern systematic workers in vertebrate zoology. A proportion, sometimes considerable, of individual variants, some of which are not distinguishable from those of other races, occur in almost every subspecific form, and the diagnosis of a subspecies must, therefore, often rest upon the sum of its average characters, which characters in many cases are fully appreciable only in a series of specimens. This statement suggests directly what we conceive to be the proper object of subspecific discrimination, *i. e.*, to call attention to existing biological facts and to furnish a convenient means of reference to them as a basis for broader generalizations, of which the identification of specimens is not the end, but to which it is merely contributory.

[1] The Auk, XXXVI, No. 2, April, 1919, pp. 242–248.

Therefore to refuse any recognition to a subspecies merely because its characters are not entirely constant, is to obscure a fact that may have important bearing on other biological problems.

As a matter of fact, *Larus hyperboreus barrovianus* is readily distinguishable by either the color of the upper parts or by the size of its bill. Our previous comparisons[1] were, of course, made with only adult birds and with those in comparable state of plumage. We should, however, have emphasized the fact that the darkest birds of *Larus hyperboreus hyperboreus* are much paler than the darkest birds of *Larus hyperboreus barrovianus*, and that the average color of the upper surface is so much deeper in the latter form that with a series it is appreciable at a glance. That occasional examples of *Larus hyperboreus barrovianus* become pale in worn plumage certainly does not invalidate this race, particularly in view of the fact that such specimens are nearly always darker than the corresponding plumage of *Larus hyperboreus hyperboreus.*

There is so much difference in size of bill in *Larus hyperboreus barrovianus* as compared with *Larus hyperboreus hyperboreus* that there usually is no difficulty at all in identifying sexed specimens. It is true, of course, that some individuals are intermediate in this character, but as mentioned above, this should not cause the rejection of *Larus hyperboreus barrovianus* as a subspecies. The length of the bill in this race is considerably (4%) less than in *Larus hyperboreus hyperboreus.* It is, nevertheless, not the best size character, for in the height of the bill there is much greater relative as well as actual divergence; this being 10% less in *Larus hyperboreus barrovianus.* This point has evidently been overlooked by Dr. Dwight, as his figure shows.[2] We, of course, should have placed more emphasis on this difference, as it forms one of the best characters for distinguishing *Larus hyperboreus barrovianus.*

The measurements of the bill in our former paper were taken from ten males and ten females of each race, all adult and properly sexed. Dr. Dwight's diagram itself[3] fully explains the reason for the discrepancy between his measurement of

[1] The Auk, XXXV, No. 4, October, 1918, pp. 467–474.
[2] The Auk, XXXVI, No. 2, April, 1919, p. 247.
[3] The Auk, XXXVI, No. 2, April, 1919, p. 247.

exposed culmen and ours. As his figure shows, his measurement is taken in a straight line from the feathers of the forehead to a point directly above the tip of the bill; while ours, as that of ornithologists generally, is the chord of exposed culmen, a considerably greater dimension, particularly in the case of a large bird, and, of course, not comparable with the other.

The above differences between *Larus hyperboreus barrovianus* and *Larus hyperboreus hyperboreus* are shown separately as well as collectively by the series in every collection the writer has examined, a list of which will be found in our original article.[1] Furthermore, all the ornithologists, in Cambridge, Mass., Philadelphia, Pa., and Washington, D. C., to whom we have pointed out the characters of *Larus hyperboreus barrovianus* agree with us in considering it a readily recognizable subspecies.

[1] The Auk, XXXV, No. 4, October, 1918, p. 468.

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PROCEEDINGS

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CRITICAL REMARKS ON PHILIPPINE ISLAND LAND SHELLS.[1]

BY PAUL BARTSCH.

Large sendings from Palawan and the adjacent regions have made it necessary to overhaul the groups of *Cochlostyla* typified by Pfeiffer's *cinerosa* and *palavanensis*. The results of this inquiry are in part given below. These sendings, mostly collected by Mr. C. M. Weber, have also made it necessary to recognize two additional races of *Amphidromus versicolor* which come from the heretofore unexplored islands of Secam and Canabungan. These are here described. A third subspecies of *Amphidromus*, from the island of Mindanao, received some time ago from Mr. Walter F. Webb, which belongs to the *Amphidromus maculiferus* group, is added.

Cochlostyla cinerosa cinerosa Pfeiffer.

1855 *Bulimus cinerosus*, Proc. Zool. Soc. London, p. 107, pl. 32, f. 5.

Pfeiffer's specimens, he states, were collected by Dr. H. E. I. C. Traill in Palawan Passage, near Borneo. The definite island from which they came is not stated and none of the specimens in our collection from the Philippines agree exactly with Pfeiffer's description or figure, although they plainly belong to the same complex. The fixing of the type locality for this subspecies will therefore have to await future sendings. Pfeiffer states that the type has 5 whorls and measures: altitude, 36.5 mm.; diameter, 13 mm.

Cochlostyla cinerosa trailli Pfeiffer.

1855 *Bulimus trailli*, Proc. Zool. Soc. London, p. 107, pl. 32, f. 6.

The above description and figure depict a very dark shell with a light band at the summit. It is quite possible that the lighter epidermis was lost in this specimen and that only the sutural band remains. However, there is also considerable difference in general shape, so that we shall consider it

[1] Published by permission of the Secretary of the Smithsonian Institution.

distinct from *Cochlostyla cinerosa cinerosa*, although it may possibly turn out to be simply a mutation of that form. We have not seen specimens of this race, either. It also was collected by Dr. Traill in Palawan Passage, near Borneo. Pfeiffer gives the following measurements: number of whorls, 5; altitude, 36 mm.; diameter, 22mm.

Cochlostyla cinerosa balabacensis, new subspecies.

This shell strongly suggests *Cochlostyla palavanensis graellsi* in color and markings but it is much more slender and much smaller than that shell. Six specimens give the following measurements:

Cat. No.	Collection.	Number whorls.	Altitude.	Greater diameter.	Lesser diameter	Locality.	Collector.
208223	U. S. N. M.	6.0	39.8	25.3	21.8	Delawan	Quadras
"	"	5.7	34.5	24.3	20.4	"	"
1 "	"	6.2	37.8	24.4	20.7	"	"
"	"	5.5	34.5	25.3	21.0	"	"
66209	"	6.0	35.1	24.8	21.3	Balabac	Steere
	Chicago Academy	5.7	34.4	24.3	21.3	"	Quadras

[1]Type.

Cochlostyla cinerosa higginsi, new subspecies.

This race lacks the strong axial striping, the last whorl being uniform buff gray. The specimen was collected by Mr. C. M. Weber on Bessie Island, and was donated by Mr. H. C. Higgins. The type, Cat. No. 336,046, U. S. N. M., yields the following measurements: number of whorls, 5.6; altitude, 36.2 mm.; greater diameter, 23.4 mm.; lesser diameter, 20.9 mm.

Cochlostyla cinerosa ulugana, new subspecies.

A lot of specimens collected by the U. S. Bureau of Fisheries Steamer *Albatross* on the Philippine Expedition at Ulugan Bay, on the central west coast of Palawan, are of a pale chocolate color, slightly, obscurely, obliquely banded; with slender darkish fenestrations near the summit, and showing a dark peripheral band when denuded of epidermis. To this race the above name may be applied. Ten specimens yield the following measurements:

Cat. No.	Collection.	Number whorls.	Altitude.	Greater diameter.	Lesser diameter	Locality.	Collector.
256138	U. S. N. M.	5.5	34.9	23.0	20.1	Ulugan Bay	U. S. B. F.
"	"	5.4	35.3	23.9	20.9	"	"
"	"	5.9	37.7	24.2	21.0	"	"
"	"	5.5	33.8	22.9	19.5	"	"
"	"	5.6	34.7	22.5	19.7	"	"
"	"	5.7	35.9	23.6	20.3	"	"
"	"	5.5	33.5	22.5	20.3	"	"
"	"	5.5	35.7	24.1	21.3	"	"
1 "	"	5.5	35.8	23.2	19.8	"	"
"	"	5.5	34.4	23.2	20.2	"	"

[1]Type.

Cochlostyla cinerosa tagbayugana, new subspecies.

A lot of shells collected by the Bureau of Fisheries' Steamer *Albatross* in Tagbayug Bay, on the south coast of southern Palawan, are decidedly more ovoid than the last named race. Unfortunately all the specimens are devoid of epidermis so that the color pattern can not be described. The shells may or may not have a dark peripheral band. Fifteen specimens yield the following measurements:

Cat. No.	Collection.	Number whorls.	Altitude.	Greater diameter.	Lesser diameter	Locality.	Collector.
256116	U. S. N. M.	5.0	29.4	21.9	19.3	Tagbayug Bay	U. S. B. F.
"	"	4.8	27.7	22.0	18.3	"	"
"	"	5.0	30.3	22.8	18.8	"	"
"	"	5.3	32.0	24.2	20.4	"	"
"	"	4.9	25.2	20.2	17.5	"	"
"	"	5.1	30.0	21.5	18.8	"	"
"	"	5.0	27.5	21.4	17.9	"	"
"	"	4.5	24.9	20.7	17.8	"	"
1 "	"	5.0	29.9	22.3	19.1	"	"
"	"	5.0	29.9	22.5	19.2	"	"
"	"	4.9	27.3	21.0	18.0	"	"
"	"	4.9	27.1	21.0	18.2	"	"
256098	"	5.0	29.8	23.0	19.6	"	"
"	"	5.1	30.5	22.4	19.0	"	"
"	"	5.0	31.9	23.0	19.5	"	"

[1]Type.

Cochlostyla cinerosa tidepolensis, new subspecies.

A slender form with dark apex followed by buff turns and terminating in the usual axial streaking of buff and brown on the last turn is before me from Tidepole Island, which may be known under the above designation.

The type, Cat. No. 310,083, U. S. N. M., has 5.3 whorls and measures: altitude, 36.4 mm.; greater diameter, 18.9 mm.; lesser diameter, 5.3 mm.

Cochlostyla palavanensis Pfeiffer.

This complex appears to have been greatly misunderstood. Most of the authors seem to have confused *Cochlostyla satyrus* Broderip with it. The specimens from southern Palawan agree perfectly with Pfeiffer's diagnosis and I shall therefore restrict Pfeiffer's name to the material from that region.

An accumulation of specimens from other parts of the island show that we will have to recognize some additional races from the large island of Palawan, but I shall refrain from that until more material will have come to hand which will give us a better understanding of the distribution of the various races than the present collection would permit.

There are, however, a number of races which come from offlying islands that demand recognition at the present time. These from the south northward are:

Cochlostyla palavanensis graellsi Hidalgo.

1886 *Cochlostyla graellsi,* Journ. de Conch., vol. 35, p. 155, pl. 8, f. 5.

This is the large *Cochlostyla* on Balabac Island, a very strongly marked race of *palavanensis* usually showing a dark sutural band.

Twenty-five specimens taken at random yield the following measurements:

Cat. No.	Collection.	Number whorls.	Altitude.	Greater diameter.	Lesser diameter	Locality.
336038	U. S. N. M.	5.7	44.4	30.8	25.8	Delawan Valley, Balabac.
"	"	6.1	45.0	29.4	25.0	"
"	"	6.1	45.4	30.0	24.8	"
"	"	6.2	46.0	30.2	25.2	"
"	"	6.1	47.4	30.3	25.2	"
"	"	6.1	46.5	31.0	26.8	"
"	"	6.4	49.4	30.4	26.3	"
"	"	6.0	46.9	29.6	24.5	"
"	"	6.0	46.8	28.5	24.2	"
"	"	6.1	50.4	32.1	26.9	"
"	"	6.1	48.9	31.0	27.2	"
"	"	6.1	46.7	29.9	25.7	"
"	"	6.1	43.5	27.7	23.9	"
"	"	6.3	48.4	28.8	24.4	"
"	"	6.4	50.8	31.5	26.2	"
"	"	6.1	47.3	32.3	26.5	"
"	"	6.1	43.8	27.5	24.0	"
"	"	6.1	44.9	28.7	23.9	"
"	"	6.0	49.3	32.7	26.9	"
"	"	6.2	45.7	30.5	25.4	"
"	"	6.0	43.9	27.8	23.8	"
"	"	6.1	47.2	30.3	26.4	"
"	"	5.8	42.3	29.8	24.7	"
"	"	6.6	49.1	29.0	25.2	"
"	"	6.5	47.3	30.0	24.8	"

Cochlostyla palavanensis mantangulensis, new subspecies.

On the island of Mantangule we have a small race of this species in which we may have the alternate light and dark axial streaking, or sometimes the light gray epidermis almost completely envelops the last whorl. Ten specimens yield the following measurements:

Cat. No.	Collection.	Number whorls.	Altitude.	Greater diameter.	Lesser diameter	Locality.
336035	U. S. N. M.	6.0	39.8	23.9	20.3	Mantangule Id.
"	"	6.0	42.8	24.5	20.2	"
"	"	5.9	40.9	26.3	21.9	"
"	"	6.0	40.0	22.3	19.5	"
"	"	6.0	40.7	24.4	20.6	"
"	"	5.8	43.3	27.5	22.8	"
[1] "	"	5.9	43.2	25.3	22.5	"
"	"	6.0	43.0	26.3	22.2	"
"	"	6.1	41.6	26.8	22.8	"
"	"	6.3	45.3	25.9	20.0	"

[1] Type.

Cochlostyla palavanensis bancalanensis Bartsch.

In 1918 we described the above subspecies in these Proceedings, volume 31, pp. 200–201. There is no need to repeat here except to say that this race from Bancalan Island is paler and less contrastedly streaked than the other forms mentioned.

Cochlostyla palavanensis culionensis, new subspecies.

This is the mollusk which von Möllendorff considered *Cochlostyla satyrus librosa*. *Cochlostyla librosa* Pfr., however, is a different race of *palavanensis* occurring in Palawan, as I shall point out when I come to discuss the Palawan members. The present race appears without a name. It is much less strongly banded than the forms heretofore discussed and has a tendency toward fenestration near the suture.

Four specimens yield the following measurements:

Cat. No.	Collection.	Number whorls.	Altitude.	Greater diameter.	Lesser diameter	Locality.	Collector.
[1]195425	U. S. N. M.	5.5	43.7	26.9	23.3	Culion Id.	Möllendorff
"	"	5.9	44.3	27.9	23.9	"	"
"	"	5.5	43.7	29.8	25.4	"	"
80	Chicago Academy	5.7	42.8	28.3	23.6	"	"

[1]Type.

Cochlostyla weberi, new species.

Shell depressed helicoid, thin, semitranslucent, white, excepting the region about the columellar area which is pale yellow. The exposed portion of the whorls is well rounded, separated by a well impressed suture, marked by decidedly retractive lines of growth. Periphery of the last whorl rounded; the convexity of the spire and the base, however, lends to it the aspect of having an obtuse angulation. Base marked like the spire, the convexity equalling that of the upper portion of the whorl. Aperture oblique, broadly oval; outer lip thin, slightly thickened at the edge, and only moderately reflected; columella very oblique, decidedly excavated; parietal wall glazed with a scarcely perceptible callus. The very thin epidermis has a somewhat crinkly appearance which gives one the impression of obsolete microscopic spiral striations which, however, are not apparent when one examines the shell under the microscope.

Three adult and an equal number of juvenile individuals are in our collection. The adult shells yield the following measurements:

Cat. No.	Collection.	Number whorls.	Altitude.	Greater diameter.	Lesser diameter	Locality.	Collector.
336032	U. S. N. M.	4.1	18.9	27.0	21.8	Candaraman Id.	Weber
256040	"	4.0	18.9	28.7	22.0	"	U. S. B. F.
[1]336048	"	4.2	21.5	32.4	24.8	"	Higgins

[1]Type.

Amphidromus versicolor secamensis, new subspecies.

Seventy-five specimens collected by Mr. Weber on Secam Island are before me, all of which have the dark tip characteristic of *versicolor.* but only one of which shows the dark flammulations on the early whorls. The rest are unicolor, or occasionally with hydrophanous lines. The general color varies from white through pale yellow to green. There is a tendency in some of the specimens to show the red sutural band characteristic of *Amphidromus quadrasi.* The lip in about half of the material is dark edged and a rosy tint surrounds the columella in about half the specimens. There is a great variation in the size of this race.

Twenty-five specimens taken at random measure:

Cat. No.	Collection.	Number whorls.	Altitude.	Greater diameter.	Lesser diameter	Locality.	Collector.
336029	U. S. N. M.	6.8	41.8	20.8	17.7	Secam Id.	Weber
"	"	6.2	31.9	17.9	15.4	"	"
"	"	6.8	40.0	20.5	17.1	"	"
"	"	6.0	29.8	16.1	14.3	"	"
"	"	6.0	31.9	18.3	15.8	"	"
"	"	6.9	44.9	22.2	18.3	"	"
"	"	6.8	35.6	18.8	15.8	"	"
"	"	6.1	30.6	16.5	14.4	"	"
"	"	6.0	29.8	17.5	14.8	"	"
"	"	6.0	28.0	16.0	13.2	"	"
"	"	6.3	32.8	17.5	15.3	"	"
"	"	7.0	42.3	22.0	18.2	"	"
1 "	"	6.9	40.7	21.5	17.7	"	"
"	"	6.0	30.0	16.8	14.0	"	"
"	"	6.1	30.0	17.6	14.9	"	"
"	"	6.4	35.4	19.8	17.0	"	"
"	"	7.0	39.3	20.7	17.7	"	"
"	"	6.2	35.0	19.0	15.5	"	"
"	"	6.1	28.5	16.7	14.0	"	"
"	"	6.1	31.4	18.4	15.7	"	"
"	"	6.2	32.9	17.8	15.3	"	"
"	"	6.5	39.4	21.0	18.3	"	"
"	"	6.8	37.8	19.8	16.0	"	"
"	"	7.0	37.8	18.3	15.3	"	"
"	"	6.4	32.8	17.4	15.0	"	"

[1] Type.

Amphidromus versicolor canabunganensis, new subspecies.

Mr. Weber has sent us sixty-two specimens of dark tipped *Amphidromus* from Canabungan Island. These are bright yellow suffused with green. Almost half of the specimens have the last whorls streaked with axial lines of green which are almost sufficiently closely spaced to render the whole whorl of a green tint. A few of the specimens are almost white. Two of the specimens have the characteristic flammulations on the early whorls. A number have dark lips. A few have a mere indication of pinkish at the columellar area.

Twenty-five of these taken at random measure:

Cat. No.	Collection.	Number whorls.	Altitude.	Greater diameter.	Lesser diameter	Locality.	Collector.
336030	U. S. N. M.	7.1	43.0	20.7	17.7	Canabungan Id.	Weber
"	"	7.1	43.3	19.8	17.5	"	"
"	"	7.1	40.3	17.5	14.5	"	"
"	"	7.0	39.8	16.5	14.4	"	"
[1] "	"	7.7	41.5	18.0	15.0	"	"
"	"	6.9	38.2	18.5	15.2	"	"
"	"	7.9	45.5	19.1	16.8	"	"
"	"	7.1	42.5	20.8	17.9	"	"
"	"	6.7	34.0	17.8	14.9	"	"
"	"	6.8	39.6	19.9	17.2	"	"
"	"	6.7	32.3	16.3	14.0	"	"
"	"	7.1	38.8	17.8	14.9	"	"
"	"	7.0	39.5	18.7	16.3	"	"
"	"	7.0	38.2	17.8	15.9	"	"
"	"	7.7	39.8	16.5	13.9	"	"
"	"	7.0	36.3	17.0	15.5	"	"
"	"	6.9	38.9	19.1	16.4	"	"
"	"	6.9	36.9	18.3	15.8	"	"
"	"	6.9	35.8	18.8	15.7	"	"
"	"	7.4	42.8	19.7	17.2	"	"
"	"	6.5	37.0	18.9	16.0	"	"
"	"	6.7	39.8	18.9	16.2	"	"
"	"	6.7	34.2	18.3	15.7	"	"
"	"	7.0	40.9	20.7	17.5	"	"
"	"	7.4	30.3	18.5	15.4	"	"

[1] Type.

Amphidromus maculiferus webbi, new subspecies.

This race of *Amphidromus maculiferus* is most nearly related to *Amphidromus maculiferus buluanensis* Bartsch. Like that race it is devoid of maculations, and like it, it is provided with strong dark brown varicial bands. It differs from *Amphidromus maculiferus buluanensis* in having the ground color yellow instead of buff. In fact, this is the only member of the *maculiferus* complex which has this coloration.

The type and two specimens of this subspecies, Cat. No. 217,035, U. S. N. M., were donated by Mr. Walter F. Webb. They were collected at Cabacan, Cotabato, Mindanao. These specimens measure:

Number of whorls.	Altitude.	Diameter.
[1] 7.1	63.4	33.4
7.0	61.0	30.0
7.0	59.5	29.0

[1] Type.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

FITCH'S THORN LEAF APHIS.

BY A. C. BAKER.

The publication by Quaintance and Baker[1] of a brief reference to *Aphis crataegefoliae* Fitch has called forth a number of inquiries by entomologists in regard to this name and that of *brevis* Sanderson. The facts are as follows:

In 1851 Fitch[2] described his *Aphis crataegefoliae* and his type specimens are now in the U. S. National Museum Collection. They have been removed from the pins and mounted in balsam and consist of alate viviparous females in rather poor condition. The species can, however, be easily determined from these types. It is the species found commonly curling the leaves of *Crataegus* in the Eastern United States and it is met with quite frequently also upon fruit trees. It proves to have a long beak and in this character is distinguishable from *Aphis bakeri* Cowen.

Recently Dr. Edith M. Patch[3] has published an account of two clover Aphids and has discussed the two species under the names *Aphis brevis* Sanderson and *Aphis bakeri* Cowen. Miss Patch was unable to obtain the types of *Aphis brevis*. The collections at that time were in Mr. Pergande's care. After Pergande's death, when the writer rearranged the National Museum Collection, he located Sanderson's types. Unfortunately these are sexes and a direct comparison with the Fitch types is therefore not possible. Reared sexes, however, have been compared with Sanderson's slides and alate forms of this same lot with the Fitch slides, and it is evident that the two are the same and

[1] Farmers' Bulletin, U. S. D. A., No. 804.

[2] Cat. Hom. N. Y. State Cab., p. 66.

[3] Journal of Research, Vol. III, p. 431.

that *brevis* must become a synonym of *crataegefoliae.* The distinction of these species from *bakeri* given by Miss Patch is confirmed by the types of these two workers.

Sanderson was evidently led astray by the referring of Fitch's name to quite a different species closely related to if not identical with *prunifoliae* Fitch.

A study of *crataegefoliae* shows that it is not an *Aphis* but belongs to the genus *Anuraphis* as does also its close relative *bakeri.* Indeed, there is a group of American species in this genus having finely imbricated cornicles, the imbrications covered with minute points. Of this group *crataegefoliae* and *bakeri* live upon rosaceous plants and migrate to clovers during the summer. These two species will stand as follows:

Anuraphis crataegefoliae (Fitch).

Aphis crataegefoliae Fitch, 1851.
Aphis brevis Sanderson, 1902.

Anuraphis bakeri (Cowen).

Aphis bakeri Cowen, 1895.
Aphis cephalacola Cowen, 1895.

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OF THE

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A NEW SALVIA FROM GUATEMALA.

BY S. F. BLAKE.

Specimens of a Salvia, collected in Guatemala by Mr. Wilson Popenoe of the Bureau of Plant Industry and recently referred to the writer for determination, prove to represent a new species which promises to be of value for horticultural purposes, from its abundance of azure-blue flowers. Mr. Popenoe believes that it will prove hardy in southern California and southern Florida, and that it will be possible to grow it elsewhere in the United States as a bedding plant, as it is readily propagated by means of cuttings. At the suggestion of the collector the species is named for Mr. Robert W. Hempstead of Tucurú, Alta Verapaz, Guatemala, who materially aided Mr. Popenoe in his explorations in Guatemala.

Salvia hempsteadiana, sp. nov.

Stems several, erect, "45 to 60 cm. high, half-woody at base," 4-sulcate with rounded angles, puberulous in the grooves, sparsely hispidulous and sessile-glandular on the angles; leaf blades 3.5 to 7 cm. long, 2.5 to 5.5 cm. wide, triangular, narrowed from just above base to apex, truncate at base, hastately 1 to 2-dentate on each side near base, crenate to subentire above, papyraceous, deep green above, puberulous along costa and chief veins, on surface sparsely gland-dotted and finely hispidulous, beneath usually purplish, gland-dotted, sparsely hispidulous along costa; petioles purplish, puberulous above, slender, 2 to 5 cm. long, their bases connected by a puberulous ring; uppermost pair of leaves reduced, lance-ovate; peduncle (6 to 8 cm. long) and inflorescence densely pilose with gland-tipped hairs and stipitate-glandular; branches of inflorescence several, ascending, the lowest 5 to 10 cm. long, the flowers loosely racemose; pedicels 1.5 to 3.5 mm. long; calyx 3 to 3.5 mm. long, stipitate-glandular and sparsely pilose with gland-tipped hairs, ciliate with chiefly eglandular hairs, green or violet-tinged, the upper lip tridenticulate, the teeth of the subequal lower lip lanceolate, acute, 0.5 mm. long; corolla 2.2 cm. long, "sky-blue," violet-blue when dried,

obliquely tubular-funnelform, stipitate-glandular and pilose with chiefly eglandular hairs, the lips equal, the lower more or less deflexed, the middle lobe of lower lip exceeding the lateral; stamens and style exserted about 1 cm., pale; filaments puberulous at base; anthers apparently violet, 3.5 mm. long.

Type in the U. S. National Herbarium, no. 1,011,724, collected at the Seed and Plant Introduction farm at Yarrow, Maryland, May 23, 1919, by P. Bisset (S. P. I. no. 44995), grown from cuttings collected in clayey soil along a mountain stream near Purulá, Baja Verapaz, Guatemala, altitude about 1525 meters, July 19, 1917, by Wilson Popenoe (no. 176).

This species is related to *S. brevicalyx* Benth., of the series Vulgares, but is easily distinguished by its loose inflorescences, longer pedicels, and different leaves. From *S. filipes* Benth. it differs widely in leaf shape.

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NEW PLANTS FROM SINALOA.

BY S. F. BLAKE.

The following new species of plants have been found in a collection from the District of San Ignacio, Sinaloa, Mexico, made by Señor Antonio E. Salazar under the direction of Señor Jesús G. Ortega, head of the Department of Agriculture, Department of Sinaloa and Nayarit. This collection has recently been sent to the U. S. Department of Agriculture for determination.

Polygala sinaloae, sp. nov.

Slender annual; stems solitary, erect or ascending, sparsely branched, 1.1 to 1.6 dm. high, 5-angulate, papillose-roughened on the angles, glabrous; leaves remote, whorled to middle of stem or higher, the two lowest whorls in 2's or 3's, oval to elliptic, acute or cuspidulate, cuneate at base, 6 to 12 mm. long including the short petiole; one or two median whorls in 5's, the blades elliptic-linear, acuminate at each end, cuspidulate, glabrous, papillose-roughened on margin, subsessile, 1 to 1.8 cm. long, 1.5 to 2.5 mm. wide; those of the branchlets mostly scattered, linear, subulate-tipped, 4 to 8 mm. long; peduncles 1 to 2 cm. long; racemes cylindric or conic, acute, rather loosely flowered, 5 mm. thick, the axis becoming 1 to 2.5 cm. long; bracts ovate, attenuate-tipped, deciduous, 1 mm. long; pedicels 0.8 mm. long; flowers magenta-pink; upper sepal broadly oval, obtusely apiculate, 1-nerved, sparsely stipitate-glandular-ciliate, 1 to 1.2 mm. long; lower sepals ovate, acute or acuminate, sparsely stipitate-glandular-ciliate, 0.8 to 1 mm. long; wings obovate, rounded at apex, 3-nerved, 2.8 mm. long, 1.4 mm. wide; keel 2 mm. long, the crest of 4 pairs of lobes, the uppermost short, adnate, emarginate, the 3 lower linear, papillose; upper petals oblong-ovate, truncate, 4-veined, 2.2 mm. long; capsule oval, obtuse, 1.7 mm. long, 1.4 mm. wide; seed ellipsoid, pubescent, 1.6 mm. long; aril 1 mm. long, the two lobes oblong.

Type in the U. S. National Herbarium, no. 1,011,733, collected in damp places at an altitude of 950 meters, Quebrada de la Mojonera, San Ignacio, Sinaloa, Mexico, February 19, 1919, by A. E. Salazar (no. 782).

Most closely related to *P. asperuloides* H. B. K., of Guatemala and British Honduras, from which it differs in its larger magenta-pink flowers and longer pedicels.

Parsonsia blepharophylla, sp. nov.

Herbaceous, 3.5 dm. high or more; stem slender, terete, grayish, densely hispidulous with slightly retrorse hairs, the divergent branches also sparsely hispid with ascending brownisb hairs; leaves opposite, the blades 2.2 to 4.5 cm. long, 1 to 1.3 cm. wide, lanceolate to lance-ovate, acuminate, rounded or subcordate and usually unequal at base, firm, entire, feather-veined with 6 to 8 pairs of prominulous lateral veins, above pale green, tuberculate-hispidulous with spreading hairs and sparsely hispid with incurved tuberculate-based hairs, toward margin hispid-ciliate, beneath scarcely paler green, tuberculate-hispidulous and along nerves hispid; petioles 1 to 2 mm. long, hispidulous and sparsely hispid; branch leaves smaller; flowers in racemes of 10 to 12 toward ends of branches and stem; bracts ovate, rather crowded, 6 to 13 mm. long; pedicels densely hispidulous, 1 to 2 mm. long; calyx 25 to 28 mm. long, nearly tubular, short-calcarate (spur 1 mm. long), slightly swollen above, 12-nerved, purplish-tinged, rather densely hispid with purplish hairs and hispidulous with short white spreading hairs, glabrous within below the stamens; petals 6, deep red with purplish-black basal spot, the 2 upper oval, 11 mm. long, 8 mm. wide, the 4 lower 3 to 6 mm. long; stamens 11, inserted about ¾ the length of the calyx above the base (the 2 dorsal epipetalous slightly lower down), the episepalous ones exserted, the 2 dorsal episepalous shorter and purplish-bearded especially at apex; ovary glabrous, 16-ovulate; style glabrous, exserted; disk short, thick, bisulcate, revolute.

Type in the U. S. National Herbarium, no. 1,011,732, collected on road from Ixtagua to Agua Fría, San Ignacio, Sinaloa, Mexico, altitude 340 meters, January 20, 1919, by A. E. Salazar (no. 698).

This species belongs to series 3 of the subsection Lophostomum of Koehne's monograph, and is distinguished from *Cuphea bilimekii* Koehne, its nearest relative, by its densely hispidulous stem and pedicels, longer calyx, and larger petals.

Piptothrix sinaloae, sp. nov.

Shrub, 0.5 to 0.8 m. high; branchlet slender, terete, fuscous-brown, rather densely incurved-pubescent with several-celled hairs; leaves opposite, the blades 5 to 5.5 cm. long, 2 to 3.2 cm. wide, ovate, acuminate, and somewhat falcate, rounded to cuneate-rounded at base, broadest in the lower third, serrate with about 11 pairs of mucronulate teeth between the entire base and apex, papyraceous, 3-nerved, prominulous-reticulate beneath, above dull green, evenly but not densely short-pubescent with spreading several-celled glandular-tuberculate-based hairs, beneath paler green, similarly short-pubescent chiefly along the veins and veinlets, densely gland-dotted; petioles 2 to 3 mm. long, similarly pubescent; panicle terminal, rounded, 4 cm. long, 5 cm. wide, densely short-pubescent with more or less spreading

glandular-based hairs; pedicels 2 mm. long or less; heads 8-flowered, slender, 4 mm. high; involucre 2 mm. high, the phyllaries about 7, somewhat unequal, linear, acutish, siccate, not distinctly nerved, gland-dotted and sparsely puberulous; corollas white, glabrous, 2.7 mm. long, with slender tube (0.8 mm. long), funnelform throat, and triangular spreading teeth; styles creamy; achenes 5-angled, whitish, sparsely puberulous, 1.3 mm. long; pappus of about 15 fragile upwardly spinulose unequal awns 0.6 to 2 mm. long.

Type in the U. S. National Herbarium, no. 1,011,731, collected in shady, sheltered places, Sierra del Mineral del Tominil, District of San Ignacio, Sinaloa, Mexico, altitude 1,500 meters, November 17, 1918, by A. E. Salazar (no. 75).

Distinguished from *P. pubens* A. Gray, the only other described species with pubescent stem and branches, by its 8-flowered (not 11-flowered) heads, and by the sparse pubescence of the lower surface of the leaves.

Perymenium stenophyllum, sp. nov.

Frutescent; branches very slender, gray, quadrangular, striate, sparsely strigose and strigillose, glabrescent; leaves opposite, the blades 3 to 10 cm. long, 1 to 3.5 mm. wide, narrowly linear, acuminate at both ends, firm, revolute, 1-nerved, above dark green, strigose and strigillose with somewhat tuberculate-based hairs, beneath strigose on costa, between the costa and the margin densely canescent-tomentulose with crisped hairs; petioles strigillose, 1 to 2 mm. long; heads about 8 mm. wide, in terminal clusters of 3 to 7; pedicels slender, striate, strigillose, 3 to 20 mm. long; disk hemispheric, 4 to 5 mm. high, 4 to 6 mm. thick; involucre 4-seriate, graduated, 4 to 5 mm. high, the outermost phyllaries much smaller, ovate, obtuse, indurated, with obscurely herbaceous tip, strigillose, ciliate, the inner ones oval to oblong-oval, rounded, obscurely herbaceous-tipped, strigillose and ciliate; corollas not seen; pales acute, strigillose on keel, 4 mm. long; ray achenes trigonous, wingless, blackish, cross-striate, strigillose on the angles, 2.5 mm. long; disk achenes similar, biconvex, 2 mm. long; pappus of about 20 stoutish strigillose-ciliate deciduous awns, those on the angles 1.3 mm. long, the others subequal, 0.8 mm. long.

Type in the U. S. National Herbarium, no. 1,010,062, collected in calcareous soil, District of San Ignacio, Sinaloa, Mexico, August 20, 1918, by A. E. Salazar (no. 501).

This very distinct species is easily recognized by its narrowly linear leaves, densely canescent-tomentulous beneath.

Verbesina ortegae, sp. nov.

Frutescent; branches greenish, striate, rather sparsely strigillose; leaves alternate, the blades 7 to 10 cm. long, 1.5 to 2.5 cm. wide, elliptic-lanceolate, serrulate with about 11 pairs of depressed mucronulate teeth, feather-veined (lateral veins about 9 pairs, translucent), not reticulate, membranaceous, above deep green, rather sparsely strigillose, smooth, beneath

duller green, inconspicuously and rather sparsely strigillose; petioles naked, not auriculate or decurrent, strigillose, 2 to 10 mm. long; heads 6 mm. wide, numerous in dense terminal and subterminal flattish panicles 3 to 3.5 cm. wide, these somewhat surpassing the leaves; pedicels densely ascending-puberulous, 3 to 7 mm. long; disk obovoid-oblong, 5 to 7 mm. high, 2.5 to 3.5 mm. thick; involucre 3-seriate, graduated, 3 to 3.5 mm. high, the phyllaries narrowly oblong, rounded, indurated, 3-vittate, with thinner obscurely herbaceous tip, appressed, white-ciliolate and slightly strigillose; rays about 5, yellow, quadrate, fertile, unequally tridentate, 2 mm. long and wide; disk corollas about 20, yellow, sparsely pilose on the obscure tube, 3 mm. long (tube about 0.7 mm.); pales obtuse, pubescent dorsally, ciliate above, 4.5 mm. long; disk achenes cuneate-obovate, blackish, very sparsely strigillose, 3.3 mm. long, narrowly winged below, the wings somewhat broadened above and adnate to the base of the awns; awns 2, slender, unequal, sparsely strigillose, 1.5 to 2.5 mm. long.

Type in the U. S. National Herbarium, no. 1,010,064, collected in the vicinity of San Ignacio, Sinaloa, Mexico, 1918–1919, by A. E. Salazar (no. 662).

This species belongs in the section *Saubinetia*, next to *V. abscondita* Klatt and *V. perymenioides* Sch. Bip. It is distinguished from the first by its thin, smooth, merely strigillose leaves, and from the second by its smaller panicles and by having its leaves strigillose, not loosely pilosulous, beneath. The species is named in honor of Señor Jesús Gonzales Ortega, Head of the Department of Agriculture in Sinaloa, under whose direction these collections were made.

Otopappus salazari, sp. nov.

Scandent shrub; branchlets slender, grayish, striate, strigillose; leaves opposite, the blades 9.5 to 12 cm. long, 2.5 to 4 cm. wide, lance-ovate, long-acuminate, often falcate, at base truncate-rounded, obscurely mucronulate-denticulate with scattered teeth, 3-nerved and prominulous-reticulate beneath, membranaceous, above deep green, evenly strigillose with slightly tuberculate-based hairs and slightly roughish, beneath slightly paler green, strigose along costa, elsewhere evenly but sparsely strigillose; petioles slender, unmargined, strigillose, 7 to 11 mm. long; heads 12 to 15 mm. wide, about 13 in a terminal ternately arranged panicle 6.5 cm. wide; pedicels strigillose, 1 to 1.7 cm. long; bracts minute; disk hemispheric, 8 to 10 mm. high, 7 to 10 mm. thick; involucre 5-seriate, graduated, 4 to 4.5 mm. high, the phyllaries oval or oblong-oval, obtuse, indurated, with obscurely subherbaceous midline and slightly spreading apex, strigillose chiefly along midline, ciliate, the outermost oblong-spatulate and subherbaceous, spreading; rays about 10, oval, yellow, fertile, 4.5 mm. long; disk corollas yellow, glabrous, 4.5 to 5 mm. long (tube slender, 1.5 to 1.8 mm.); pales acute, spinulose-ciliolate on keel and margin, 6 mm. long; ray achenes trigonous, rather narrowly winged, the wings broadened above and adnate to the awns throughout their length; awns 3, the inner one 1.5 mm. long, the two outer about 0.5

mm. long, all connected at base by the lacerate corona, the latter about 0.5 mm. long; disk achenes strongly compressed, glabrous except for the spinulose-ciliolate wings, 3 mm. long, narrowly winged, the wings broadened above and adnate to the awns throughout their length; inner awn 2 mm. long, the outer 1 mm. long; squamellae about 6, united at base into a lacerate corona, 0.4 mm. long.

Type in the U. S. National Herbarium, no. 1,010,063, collected at Ixtagua, District of San Ignacio, Sinaloa, Mexico, August 12, 1918, by A. E. Salazar (no. 450).

Otopappus salazari is easily distinguished by its radiate heads, long pedicels, and evenly strigillose leaves.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

GENERAL NOTES.

A NOTE ON THE EYE OF THE BLACK SKIMMER (RYNCHOPS NIGRA).

The pupil of the eye in the majority of species of birds is rounded or circular in form, whether expanded or contracted. Few exceptions to this have been known. In some of the gallinaceous birds the pupil when contracted is said to become slightly elliptical[1] and in owls this condition is at times slightly more accentuated.

Recently while handling a living black skimmer (*Rynchops nigra*) I was astonished to note that when the eye was turned to the sun the pupil contracted to an elongated vertical slit as in the eye of a cat. The opening was reduced very little in its vertical length but narrowed greatly laterally so that when contracted the opening was nearly as high as when expanded. When fully opened the upper and lower points of the pupillar aperture were marked by distinct angles so that even at this time the opening was not circular. The swinging motion as the sides of the pupil moved toward one another in contracting was very peculiar.

It has been stated by Gadow (in the citation given above) and others that owls also have the opening of the pupil a distinct slit as in the eye of a cat. Recently I have examined living individuals of the Snowy, Great Horned, Barn, and Screech Owls finding, however, as I had expected from previous observations, that the pupil did not differ markedly from that in other birds. For example immature individuals of the Great Horned and Screech Owls, when suddenly exposed to the light from a high candle power electric light bulb, contracted the pupil until it was very small, while in form it varied only from round to slightly elliptical. In the latter case the axis of the slightly elongated opening was longitudinal and not vertical. Adult individuals examined in larger enclosures by the aid of high power binoculars exhibited the same peculiarities and though I have handled many owls of the common North American species I have yet to see one with form of the eye differing from that described above.

The peculiar development found in the Black Skimmer therefore is, so far as I am aware, unique, though there is little doubt but that the same peculiarity will be found in the other species composing the genus *Rynchops*. It may be that this slit-like eye opening like the peculiar compressed bill with its elongated lower mandible is another adaptation brought about by the strange feeding habits of these birds. —*Alexander Wetmore.*

[1] Gadow, H., Klassen und Ordnungen des Thier-Reichs: Vögel, Vol. I, 1891, p. 436.

SOME NOTES ON THE PLUMAGE OF THE MALE FLORIDA RED-WING (AGELAIUS P. FLORIDANUS).

While engaged in field work in Louisiana during June of the present year, my attention was called to a seeming absence or greatly restricted color marking on the shoulders of a considerable percentage of the males of the local red-wings (apparently *Agelaius p. floridanus*); and as I can discover no reference to this condition during the breeding season, the following notes may be of interest.

Red-wings were most abundant about the marshes of the mainland, but were also represented by breeding examples on the outermost islands of the Gulf, such as the Chandeleur and Errol groups, or wherever suitable environmental conditions existed. In Cameron Parish, southwest Louisiana, they were particularly abundant, the extensive marshes which characterize this region affording ideal breeding places and nests containing eggs in various stages of incubation or newly hatched young, were observed daily. The neighborhood of dykes bordering rice fields and the levees of the canals formed the centers of abundance for nests. An occasional nest containing well-fledged young was found but in no case were they able to fly, so that the breeding season could be considered as at its height. At this point, males in the full brilliant nuptial plumage were in the vast majority and only an occasional example was noted that lacked the glossy black body and bright red epaulettes. But at Avery Island, Iberia Parish, I was at once impressed by the reversed ratio, and, although it is probable that they were breeding in the vicinity (sparingly, at least), no nests were discovered, nor were more than one or two females seen during a period of six days. Dull colored males were extremely numerous, fully 150 being under observation one afternoon as they fed from the feed boxes on the State Game Farm. As they had become quite tame here it was a simple matter to select a series exhibiting the variations in color and markings.

Special attention was paid to the dissection of the specimens obtained as a means of determining the exact conditions of age and reproductive development. In so far as the cellular structure of the skull may be employed as a criterion of age, the specimens were all obviously adult, *i. e.*, at least one year old. The undeveloped state of the sexual organs, however, was conclusive proof that they were non-breeders, and in addition to this condition, the plumage showed unmistakable signs of immaturity, the most apparent being the aforementioned obscured shoulder patches. On one specimen red or orange is almost totally lacking, a few under feathers alone exhibiting any trace of color other than black. From this extreme a complete and fully connected gradation is afforded, the examples at the other end of the series displaying well marked patches approximating bittersweet orange,[1] but even this contrasts greatly when compared with the brilliant scarlet red of the breeding birds. A few of these non-breeders (the ones with the most restriction on the shoulder color) still show a few of the ashy tips to the feathers of the upper breast; this last, however, is extremely variable and in no case is it at all extensive. Moreover, the glossy and more or less

[1] Ridgway's Color Standards and Nomenclature.

iridescent black of the head and body plumage of the breeding bird is almost entirely lacking, the black being dull and non-lustrous. On the lower belly and back it is decidedly brownish, while the remiges are ashy brown on the portion extending beyond the closed secondaries, a dull brownish black gradually replacing this color anteriorly. This color is also shared by the tertiaries in a lesser degree, and the entire body plumage has a more or less worn and rough appearance as contrasted with the smooth glossy covering of the breeders.

A parallel to this unique condition is probably to be found in the orchard, hooded, and perhaps other tropical and sub-tropical orioles which require three years for the acquisition of the full plumage, although it may be that these species will breed in the garb of immaturity (I have no definite information concerning this last). Among the other varieties of *Agelaius* I know of none that exhibit this peculiarity which if proven consistent may make necessary a rearrangement of the group, with *A. p. floridanus* raised to full specific rank. —*F. C. Lincoln, Denver, Colo.*

A NEW NAME FOR A DROMIID CRAB.

In 1902[1] I changed the current name of the Indo-Pacific *Dromia*, the most widely distributed of the sponge-crabs, from *Dromia rumphii* Fabricius, 1798, to the earlier name *Dromia dormia* (Linnaeus).[2]

A similar change should be made in the name of the European *Dromia*, now known as *Dromia vulgaris* Milne Edwards. The Linnaean name, *caput mortuum*, should be restored and the species should be called *Dromia caput mortuum*[3] (Linnaeus). Milne Edwards himself says[4] that Linnaeus's *caput mortuum* appears to be simply an age variety of *vulgaris*.

The species to which Milne Edwards gave the name *caput mortuum*[5] is altogether different: it occurs in the Indo-Pacific, and is as large as *D. dormia* or the true *D. caput mortuum*, but is less abundant. *D. caput mortuum* Milne Edwards, 1837, is now in need of a new specific name, for which I would suggest **edwardsi.** As the species has been placed in *Dromidiopsis* by Borradaile,[6] tentatively, and later by Ihle,[7] its full name is **Dromidiopsis edwardsi.**

To summarize the above changes in three of the largest Dromiids,

Dromia dormia (Linnaeus, 1763)=*D. rumphii* Fabricius, 1798, and most subsequent authors. Indo-pacific.

Dromia caput mortuum (Linnaeus, 1766)=*D. vulgaris* Milne Edwards, 1837. Western Europe, west coast of Africa, Mediterranean.

Dromidiopsis edwardsi Rathbun, 1919=*Dromia caput mortuum* Milne Edwards, 1837, not *Cancer caput mortuum* Linnaeus, 1766. Indo-Pacific.

—*Mary J. Rathbun.*

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[1] Proc. U. S. Nat. Mus., vol. 26, p. 32.

[2] *Cancer dormia* Linnaeus, Amoen. Acad., vol. 6, 1763, p. 413.

[3] *Cancer caput mortuum*, Sys. Nat., ed. 12, vol. 1, 1766, p. 1050, type locality, Algiria.

[4] Hist. Nat. Crust., vol. 2, 1837, p. 173, footnote.

[5] Op. cit., p. 178.

[6] Ann. Mag. Nat. Hist., ser. 7, vol. 11, 1903, p. 299.

[7] Die Decapoda Brachyura der Siboga-Expedition, I, Dromiacea, 1913, p. 28.

ADDITIONS TO "A LIST OF FAMILIES AND SUBFAMILIES OF ICHNEUMON-FLIES OR THE SUPERFAMILY ICHNEUMONOIDEA (HYMENOPTERA)."[1]

Since publishing the first list of additions to the above I have come across the following:

Brachycyrtinae new subfamily name=(Proterocryptini Cushman, Proc. U. S. Nat. Mus. 55 (543) 1919.

[(*Proterocryptus*) *Brachycyrtus nawaii* Ashmead, etc.] Roman 1915 (5, 6) regards this as a member of the Ophioninae nearest Cremastinae but with characters in common with *Hellwigia* and *Banchus*, Cushman 1919 l. c. regards this as a member of the Tryphoninae, nearest Sphinctinae.

Merolidinae new subfamily=(Merolidini Brethes), between Amblytelinae and Listrodrominae.

(*Merolides* Brethes.)

(Mimagathinae Enderlein)=**Stantoninae** new subfamily name. Between Bassinae and Sigalphinae.

(*Stantonia* Ashmead and *Mimagathis* Enderlein).

Orgilinae new subfamily, between Blacinae and Leiophroninae.

(*Orgilus* Haliday and *Hymenochaonia* Dalla Torre).

Orthognathellinae Szepligeti, between Phaeogeninae and Alomyinae.

(*Orthognathella* Szepligeti).

—*Henry L. Viereck.*

A FORMER RECORD OF THE HEATH HEN (TYMPANUCHUS CUPIDO) AT WASHINGTON, D. C.

I have recently met with an apparently unrecorded specimen of the Heath Hen (*Tympanuchus cupido*) that was secured at Washington, D. C., on April 10, 1846, by Dr. Alex. McWilliams. This specimen, No. 12,567, U. S. National Museum, was entered in the Catalogue of the Division of Birds, Vol. 3, July 19, 1859. The bird was mounted, and sent to the Chicago Academy of Sciences in 1870, and was destroyed in the Chicago fire of 1871. As Professor Baird was extremely accurate in his entries of localities, and as, at that early date, it was extremely unlikely that the bird could have been taken elsewhere and sent to Washington, it would appear that the Heath Hen should be added to the list of birds of the District of Columbia. The A. O. U. Check List, Third Ed. 1910, 143, gives the range as "Formerly southern New England and parts of the Middle States." The records of the Prairie Chicken (*Tympanuchus a. americanus*) as given by Kirkwood, The Birds of Maryland (Trans. Md. Acad. Sciences, 1895, page 296, and Ridgway, Forest and Stream, Vol. 24, pp. 204 and 248) were from birds obtained in the west and liberated in Kent County by Colonel Edward Wilkins, early in the winter of 1885 or 1886. The range of the Heath Hen should therefore be extended as far south as the District of Columbia.

—*B. H. Swales.*

[1]Proc. Biol. Soc. Washington, 31 (69–74) 1918.

PAGOPHILA EBURNEA VERSUS PAGOPHILA ALBA.

The name of the ivory gull has recently been changed from *Pagophila alba* (Gunnerus) to *Pagophila eburnea* (Phipps) because the original description of *Pagophila alba* (*Larus albus* Gunnerus, in Leem's Beskr. Finm. Lapp., 1767, p. 285; northern Norway) was not considered identifiable (*cf.* Hartert et al., List British Birds, 1912, p. 203; Committee, British Ornith. Union, List British Birds, 1915, p. 394). The specific name *alba* was originally applied to the ivory gull by Stejneger (Proc. U. S. Nat. Mus., VI, June 13, 1882, p. 39), and has since been generally accepted by American ornithologists. An examination of the original description seems to leave little doubt that the name is properly applicable to the species in question, since this is the only gull with normally pure white plumage living in the far northern regions. The bird should, therefore, continue to be known as *Pagophila alba*.

For the benefit of those who may not have access to the rare book in which *Larus albus* Gunnerus appeared, we hereby transcribe the original description:

"Præter Laros jam enumeratos apud nos adhuc datur 1) Larus *albus*, Norlandis *Vald-Maase* dictus, qui toto interdum corpore albus esse & Laro cano vel & fusco magnitudine convenire perhibetur. V. Dn. Matthias Brunn, Vefsensium nunc pastor, se hunc in præfectura Vosteraalen Norlandiæ nonnunquam vidisse mihi persvasit. Plur. V. Dn. Buschmann, præpositus Helgelandiæ & paroeciæ Næsne pastor meritissimus, me itidem certiorem fecit, eundem Larum in Helgelandia nostra vulgo satis notum esse, ut ab omnibus reliquis Laris ante memoratis distinctum, licet ipse eum nondum nisi eminus viderit. Ni valde fallor, Larus hic habendus est idem ac *Senator Martensii*, qui toto corpore albus, rostro & pedibus nigris describitur esse. Sed, quid de nigredine rostri judicem, nescio, quum hic color in rostris reliquorum Larorum, e. g. marinorum, hyberboreorum, canorum & tridactylorum jam adultorum prorsus evanescat. Characterem Martensii, quem addit, nimirum: *tridactylus*, taceo; illum tamen ob oculos habeant, qui occasionem Larum nostrum album examinandi nacti fuerint."

—*Harry C. Oberholser.*

SOME NECESSARY CHANGES IN CRUSTACEAN NOMENCLATURE.

In 1915 Mr. L. A. Borradaile (Ann. and Mag. Nat. Hist. [8], vol. 15, p. 207) distributed the species of *Periclimenes* among four subgenera which he called *Ensiger*, *Corniger*, *Cristiger* and *Falciger*. The type of the genus *Periclimenes*, *P. insignis* Costa, 1844=*Alpheus scriptus* Risso, 1826, falls in the subgenus *Cristiger*, which should therefore be known as the subgenus *Periclimenes*. The name *Corniger* has previously been used once in fishes and twice in crustacea; it may be replaced by the name **Laomenes**, nom. nov. The name *Falciger* has been previously used in the coleoptera; it may be replaced by **Cuapetes**, nom. nov. —*Austin H. Clark.*

THE STATUS OF THE GENUS ASARCIA SHARPE.

The genus *Asarcia* was instituted by Dr. R. B. Sharpe (Cat. Birds Brit. Mus., XXIV, 1896, pp. 68, 86) for the reception of *Parra variabilis* Linnaeus (=*Fulica spinosa* Linnaeus). By most recent authors, however, it has been treated as a subgenus. It differs from *Jacana* Brisson (type, *Parra jacana* Linnaeus) in the character of its frontal shield and rictal lappets, characters which are of importance in the generic differentiation of the Jacanidae. In *Jacana* the frontal shield is relatively narrow and its posterior margin is two-lobed; and the rictal lappets are well developed. In *Asarcia,* however, the frontal shield is broad and is posteriorly three-lobed; and the rictal lappets are either rudimentary or absent. These differences are conspicuous structural characters, without the slightest intergradation either through intermediate species or intermediate individuals in either of the type species; and, therefore, indicate that *Asarcia* should stand as a full genus.

The forms of this genus are:

Asarcia spinosa spinosa (Linnaeus).
Asarcia spinosa gymnostoma (Wagler).
Asarcia spinosa violacea (Cory).

—*Harry C. Oberholser.*

THE NAMES OF THE SUBFAMILIES OF SCOLOPACIDAE.

That the Scolopacidae are properly separable into three subfamilies has been well shown by Mr. P. R. Lowe (Ibis, Ser. 10, III, No. 3, July, 1915, pp. 609-616). The names that he uses for these subfamilies, however, apparently require some alteration.

The name Eroliinae, used by Mr. Lowe for the group which includes *Canutus canutus, Arquatella maritima,* and their allies, and which formerly bore the name Tringinae, needs changing by whichever of the two principal rules for the determination of family names we employ. This is evident, since *Canutus* (anonymous, 1804) is the type genus of the subfamily because under the name *Tringa* it formed the basis of the subfamily Tringinae Gray (List Genera Birds, 1840, p. 69). It is also the oldest generic term in the group, since *Erolia* Vieillot, the basis of Eroliinae, dates from 1816. In fact, *Ereunetes* Illiger (1811) is also older than *Erolia.* The name of this subfamily, therefore, must become Canutinae.

The name of the subfamily called by Mr. Lowe Tringinae, but which was formerly known as Totaninae, also should be changed. The type genus of this subfamily, if *Numenius* is excluded, is *Totanus* Bechstein, since this then would be the basis of the first subfamily name, Totaninae, applicable to the group (Gray, List Genera Birds, 1840, p. 68). If, however, the genus *Numenius* be added, the designation of the subfamily would become Numeniinae, since this has anteriority over Totaninae (Gray, List Genera Birds, 1840, p. 68). If, however, the less satisfactory method of determining the subfamily name, that of using the oldest generic name for its basis be employed in this case, the name of this subfamily would, of course, remain Tringinae.

According to our views as above expressed, the three subfamilies of Scolopacidae should be called Scolopacinae, Canutinae, and Numeniinae.

—*Harry C. Oberholser.*

NOTES ON THE NAMES OF HALOBAENA CAERULEA AND PRION VITTATUS.

The blue petrel has in recent years commonly been known as *Halobaena caerulea*. It was first discovered, as pointed out by Mr. G. M. Mathews (Birds Australia, II, pt. 2, July 31, 1912, p. 206), by George Forster, by whom it is described as follows: "the blue petrel, so called from its having a bluish grey colour and a band of blackish feathers across the whole wing" (A Voyage Round the World, I, 1777, p. 91). In a footnote on a subsequent page of the same work (A Voyage Round the World, I, 1777, p. 98) Forster names this same blue petrel [*Procellaria*] *vittata*. Mr. Mathews considers this indeterminable, but there is, of course, no doubt at all regarding Mr. Forster's intention, and his blue petrel, named on page 98, is, of course, the same bird that he describes with sufficient accuracy, as above shown, on page 91. There is, consequently, no reason for considering this name a nomen nudum; and since this blue petrel is the same bird that Gmelin subsequently called *Procellaria caerulea* (Syst. Nat., I, ii, 1789, p. 560), as is clearly indicated by his citation of "Forst. it. I, p. 91," we see no other course than to use the name *Procellaria vittata* in the combination *Halobaena vittata* for the blue petrel, commonly known as *Halobaena caerulea*. Its type locality, it may be of interest to mention, is, as determined from an examination of Forster's work above cited, at sea, between the Cape of Good Hope and latitude 47°10′ south, and between longitude 15° and 20° east.

Since *Procellaria vittata* Forster is found thus to be applicable to *Halobaena caerulea* (Gmelin), the *Procellaria vittata* of Gmelin is therefore preoccupied as the name of *Prion vittatus*, for which it has commonly been in use, and the latter must take the next available designation, *Procellaria forsteri* Latham (Index Ornith., II, 1790, pp. 827), which is merely a new name for *Procellaria vittata* Gmelin, with the same synonymy and type locality (New Zealand). If all the subspecies recently described by Mr. Mathews prove valid, the forms of this species will stand as follows:

Prion forsteri forsteri (Latham).
Prion forsteri gouldi Mathews.
Prion forsteri missus Mathews.
Prion forsteri macgillivrayi Mathews.
Prion forsteri salvini Mathews.
Prion forsteri keyteli Mathews.

—*Harry C. Oberholser.*

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

FOUR NEW KANGAROO RATS FROM WEST-CENTRAL CALIFORNIA.

BY JOSEPH GRINNELL.

Contribution from the Museum of Vertebrate Zoology of the University of California.

Further study of the kangaroo rats of California has led the writer to conclude that there are no good grounds for retaining any longer the supposed genus *Perodipus*. The presence or absence of the first pedal digit or at least its claw, both of which are only rudiments at best, proves to be an inconstant feature within three of the species. No other characters have been found which seem of generic value; and on the other hand there are many which occur in all the species with remarkable uniformity. The kangaroo rats in toto comprise one ideal genus. The following new forms are therefore all described under the older name *Dipodomys*, irrespective of whether the specimens at hand show five toes on each hind foot or only four.

Dipodomys jolonensis, new species.

JOLON KANGAROO RAT.

Type.—Male adult, skin and skull; No. 29087, Mus. Vert. Zool.; valley floor one mile southwest of Jolon, Monterey County, California; October 18, 1918; collected by J. Dixon; orig. No. 6970.

Comparative diagnosis.—A broad-faced, normally five-toed, middle-sized kangaroo rat perhaps nearest like its next neighbor on the north, *Dipodomys goldmani* (Merriam). Differs from *goldmani* in somewhat larger size, in decidedly larger auditory and mastoid bullae, in narrower interparietal and supra-occipital, in more heavily tufted and crested tail, in dorsal body-color being paler, and in light markings on head and tail being whiter and more extended. Similar to *Dipodomys swarthi* (Grinnell) in size and cranial features, but general body-color much darker (due to the greater extent of

the dusky tippings to the hairs), dark portions of ear blacker, and arietiform marking across face and involving continuously the areas at bases of main tufts of vibrissae and top of nose, much blacker and hence more boldly contrasted.

Measurements (in millimeters).—Of type: Total length, 310; tail vertebrae, 185; hind foot, 44; ear from crown, 15; greatest length of skull, 43.0; breadth of skull across bullae, 27.0; spread of maxillary arches, 22.9; width of maxillary arch at middle, 5.7; greatest length of nasals, 16.3; greatest width of rostrum near end, 4.6. Weight, in grams, 82.9.

Distribution.—Material at hand representative of this new form indicates a range comprising the upper (southern) end of the Salinas Valley and tributary smaller valleys, from vicinity of Peachtree and San Lucas, in Monterey County, south at least to San Miguel, in San Luis Obispo County; west to Jolon. Altitudinal range, 400 to 1,500 feet. Life zone, chiefly Lower Sonoran.

Dipodomys berkeleyensis, new species.

BERKELEY KANGAROO RAT.

Type.—Male adult, skin and skull, No. 28,729, Mus. Vert. Zool.; top of hill at head of Dwight Way, Berkeley, California; October 6, 1918; collected by J. Grinnell and D. D. McLean; orig. No. 4815, J. G.

Comparative diagnosis.—A broad-faced, five-toed, middle-sized kangaroo rat most nearly similar to *Dipodomys goldmani* (Merriam). Differs from *goldmani* in much more heavily tufted and crested tail, in slightly smaller ear, and in broader and shorter rostrum. From its near neighbor to the east, *Dipodomys tularensis* (Merriam), *berkeleyensis* differs externally in darker tone of dorsal body-color, in more solidly black and broader dorsal and ventral tail stripes, in light markings on ears and face being smaller in extent and major dark marking blacker, and in skull having much less inflated bullae, broader interparietal, and broader rostrum.

Measurements (in millimeters).—Of type: Total length, 301; tail vertebrae, 180; hind foot, 41; ear from crown, 12; greatest length of skull, 39.5; breadth of skull across bullae, 24.1; spread of maxillary arches, 23.0; greatest length of nasals, 14.5; greatest width of rostrum near end, 4.5; width of maxillary arch at middle, 5.0. Weight, in grams, 77.0.

Distribution.—Known so far only from the open hill tops immediately to the east of the city of Berkeley, California. Altitudinal range, 300 to 1,700 feet. Life zone, Upper Sonoran.

Dipodomys sanctiluciae, new species.

SANTA LUCIA MOUNTAIN KANGAROO RAT.

Type.—Male adult, skin and skull; No. 29,023, Mus. Vert. Zool.; ridge clothed with digger pine and chaparral, one mile southwest of Jolon, Monterey County, California; October 21, 1918; collected by J. Grinnell; orig. No. 4950.

Comparative diagnosis.—A narrow-faced, five-toed, large-sized kangaroo rat belonging in the *agilis* series and nearest *Dipodomys venustus* (Merriam).

Differs from *venustus* externally but slightly, in less deeply cinnamon tone of body coloration. Coloration close to that in *Dipodomys agilis* Gambel; size, however, particularly of ear much greater than in *agilis*. Differs from *venustus* as regards skull in larger size and especially in larger mastoid bullae.

Measurements (in millimeters).—Of type: Total length, 315; tail vertebrae, 190; hind foot, 46; ear from crown, 16; greatest length of skull, 42.5; breadth of skull across bullae, 25.8; spread of maxillary arches, 23.0; greatest length of nasals, 15.5; greatest width of rostrum near end, 4.3; width of maxillary arch at middle, 5.3. Weight, in grams, 82.0.

Distribution.—Inhabits the chaparral association in the Santa Lucia Mountain region of southern Monterey County and northern San Luis Obispo County (south at least to Santa Margarita). Specimens at hand show an altitudinal range of 900 to 5900 feet. Life zone, Upper Sonoran, locally Transition.

Dipodomys californicus eximius, new subspecies.

LESSER CALIFORNIA KANGAROO RAT.

Type.—Male adult, skin and skull; No. 18,347, Mus. Vert. Zool.; Marysville Buttes at 300 feet altitude, 3 miles northwest of Sutter, Sutter County, California; April 5, 1912; collected by F. H. Holden; orig. No. 167.

Comparative diagnosis.—A broad-faced, normally four-toed, middle-sized kangaroo rat similar in general appearance to topotypes of *Dipodomys californicus californicus* Merriam. Differs in typical form from *californicus* in much smaller ear and smaller and shorter skull; rostrum relatively short and mastoid bullae far less inflated; teeth appreciably smaller.

Measurements (in millimeters).—Of type: Total length, 303; tail vertebrae, 182; hind foot, 42; ear from crown, 13; greatest length of skull, 36.7; breadth of skull across bullae, 22.0; spread of maxillary arches, 21.9; greatest length of nasals, 13.9; greatest width of rostrum near end, 4.3; width of maxillary arch at middle, 5.3.

Distribution.—Inhabits the Marysville Buttes, and the Sierran foothills along the eastern side of the Sacramento Valley from the vicinity of Tehama southeast at least to Limekiln, Eldorado County.

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PROCEEDINGS

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SOME NEW EASTERN ANTHOMYIIDAE (DIPTERA).

BY J. R. MALLOCH.

In this paper I have described four new species of Anthomyiidae, the types of the first two being deposited in the collection of Boston Natural History Society and those of the other two in the collection of the U. S. Bureau of Biological Survey. A comparison with the most closely related species is given at the end of the descriptions or their most characteristic features are noted, but as these and all of the species recently described by me have been incorporated in synopses which I hope soon to publish their relationships will be fully dealt with later.

Phaonia rufibasis, sp. n.

Male.—Black, slightly shining, densely gray pruinescent. Head black, parafacials in front, and cheek in center brown; second antennal joint and base of third, and all of palpi reddish testaceous. Legs reddish testaceous, fore coxae basally, and tarsi slightly infuscated. Thorax quadrivittate; scutellum largely reddish testaceous. Abdomen with a blackish interrupted dorso-central vitta and lateral checkerings. Wings clear, crossveins infuscated. Calyptrae and halteres yellow.

Eyes with long rather sparse hairs; frons at narrowest part less than the width across posterior ocelli; parafacial narrower than third antennal joint; cheek four times as high as width of parafacial; longest hairs on arista longer than width of third antennal joint. Presutural acrostichals absent; prealar over half as long as the bristle behind it; postsutural dorso-centrals 4; hypopleura hairy on upper margin in front of spiracle; sternopleurals 1:2; scutellum bare below and on sides. Abdomen broadly ovate; basal sternite with a few hairs; fifth sternite with a deep wedge-shaped posterior incision. Fore tibia unarmed at middle; mid femur with 4 or 5 long bristles on basal half of postero-ventral surface; mid tibia with 3 posterior bristles; hind femur with a series of long bristles from near base to apex on antero-ventral surface and one bristle on middle of postero-ventral; hind tibia with 3 or 4 antero-ventral and 2 antero-dorsal bristles, the calcar not very long, anterior surface with a series of setulose hairs. Costal thorn short.

Female.—Similar to the male in color. The eyes are almost bare, the frons is one-third of the head width, widened anteriorly, and the postero-ventral surface of hind femur has no median bristles.

Length, 8.5–10 mm.

Type, male, Chester, Mass., August 3, 1911. Allotype, Gt. Barrington, Mass., June 15, 1915 (C. W. Johnson).

This species is most closely allied to *errans* Meigen, but differs in having pale palpi and the antennae partly pale.

Phaonia flavibasis, sp. n.

Male.—Black, slightly shining, thorax and abdomen partly yellowish testaceous. Head black, orbits, face, and cheeks densely silvery pruinescent; orbits on inner margins, anterior half of parafacials, facial ridges, cheeks, first, second, and base of third antennal joints, and palpi yellowish testaceous. Mesonotum distinctly quadrivittate; humeri and scutellum yellowish testaceous. Basal half of abdomen yellowish testaceous. Legs yellowish testaceous, tarsi subfuscous. Wings, calyptrae, and halteres yellowish.

Eyes sparsely pubescent, separated at narrowest part of frons by a little less than width across posterior ocelli, the interfrontalia obliterated at middle of frons; third antennal joint twice as long as second; arista with sparse hairs, the longest of which is about as long as width of third antennal joint; parafacial in profile narrower than third antennal joint; cheek about one seventh as high as eye. Presutural acrostichals absent, one pair in front of scutellum; postsutural dorso-centrals 4; prealar bristle less than half as long as the one behind it; hypopleura bare; sternopleurals 1:2. Basal abdominal sternite bare; fifth sternite with a rather small rounded posterior excavation. Fore tibia unarmed at middle, the antero-dorsal apical bristle very weak; mid tibia with three or four posterior bristles; hind femur with about eight rather short bristles on apical half of antero-ventral surface and a few short hairlike bristles on basal half of postero-ventral surface; hind tibia with from three to five antero-ventral and two antero-dorsal bristles; calcar not very long. Venation normal; outer cross-vein curved.

Length, 6.25 mm.

Type, Chester, Mass., May 28, 1912 (C. W. Johnson). One male.

Structurally this species very closely resembles *bysia* Walker (*apicata* Johannsen), but that species differs in color and in bristling of the thorax.

Phaonia aberrans, sp. n.

Male.—Black, densely grayish pruinescent. Orbits and parafacials silvery, face and cheeks whitish pruinescent; second antennal joint, base of third, and palpi except apices reddish. Thorax inconspicuously quadrivittate. Abdomen in type greasy, but apparently marked as in *rufibasis.* Legs reddish testaceous, coxae, and femora except apices blackened, tarsi slightly darker than tibiae. Wings slightly brownish, cross-veins narrowly infuscated. Calyptrae whitish. Halteres with the knobs brown.

Eyes with a few very inconspicuous hairs on lower half; frons at narrowest part over twice as wide as width across posterior ocelli; each orbit a little over half as wide as interfrontalia, with some moderately long bristles and shorter hairs, which extend almost to anterior ocellus; third antennal joint narrow, about twice as long as second, extending about four-fifths of the way to mouth-margin; arista with its longest hairs not as long as width of third antennal joint; parafacial nearly twice as wide as third antennal joint and half as wide as height of cheeks, the latter with a series of strong bristles along lower margin and above these 2 or 3 strong upwardly curved bristles; vibrissal angle slightly produced, with a number of short bristles at base of vibrissa. Thorax as in *errans* Meigen except that the hypopleura is bare. Abdomen ovate; hypopygium not protruded, but rather large; fifth sternite with short stout processes, separated basally by a quadrate incision, their inner margins concave on apical half, the apices slightly chitinised, surface of sternite with numerous, but not conspicuous bristles; basal sternite bare. Fore tibia with or without a median bristle; mid femur with a complete series of postero-ventral bristles; mid tibia with about 4 posterior bristles in an irregular double series; hind femur with bristles on entire length of antero-ventral surface, those on basal half short, the postero-ventral surface with long bristles on basal half; hind tibia with 2 or 3 antero-dorsal and 3 antero-ventral, bristles, the postero-dorsal surface with two bristles above the usual calcar, the latter strongest; claws and pulvilli all long. Third vein bare at base; last section of fourth vein about 1.5 as long as preceding section; outer cross-vein curved.

Length, 9 mm.

Type, Beltsville, Md., April 1, 1917 (W. L. McAtee). One male.

This species resembles *errans* and *rufibasis* in habitus but differs in many respects from both of these. The only species known to me from North America which has additional bristles above the calcar is *deleta* Stein, but the other armature of the hind tibia and also that of the hind femur of that species differs very much from that of *aberrans*.

Hylemyia winnemana, sp. n.

Male.—Black, slightly shining, with distinct, but not dense pruinescence. Head with white, almost silvery pruinescence on orbits, face, and cheeks. Thorax indistinctly trivittate. Abdomen densely whitish pruinescent, with a dorso-central vitta and the anterior margin of each tergite black. Wings clear. Calyptrae white. Halteres yellow.

Eyes separated by a little more than width of anterior ocellus; parafacial nearly as wide as third antennal joint, narrowed below; cheek about as high as width of third antennal joint, with a series of slender marginal bristles, a few of those near anterior angle upwardly curved; arista pubescent. Thorax with 3 or more pairs of slender presutural acrostichals; prealar over one third as long as the bristle behind it; sternopleurals 1:2. Abdomen slender, segments subequal in length; hypopygium large, but not very conspicuous; fifth sternite with long processes which are about twice as long as broad, bare except for a few short surface hairs, and a long strong

backwardly directed bristle near tip of each. Fore tibia with a weak median posterior bristle, the preapical bristle longer than usual; mid femur with some short antero-ventral and a number of longer postero-ventral bristles; mid tibia with the posterior bristles weak; hind femur with a series of long very closely placed bristles from base to apex on antero-ventral surface, the hairs on anterior surface strong and erect, the postero-ventral surface with short, hair-like bristles from base to apex; hind tibia stouter than usual, furnished on all surfaces with erect short hairs, one fine postero-dorsal bristle about one-third from apex, and an unusually long apical dorsal bristle. Costal thorn very small; veins 3 and 4 slightly convergent.

Length, 4 mm.

Type, Plummers Island, Md., April 17, 1912 (W. L. McAtee). One male.

Distinguishable from any species of the genus known to me by the very characteristic bristling and hairing of the hind femora and tibiae.

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A NEW SOLPUGID FROM PANAMA.

BY RALPH V. CHAMBERLIN.

The new solpugid described below is based upon two females collected by Mr. H. F. Dietz in the nest of a termite on Taboga Id., Republic of Panama, and transmitted to me for identification by Mr. Thomas E. Snyder. In general structure and appearance the form resembles *Ammotrecha cubae* (Lucas); but, aside from differences in coloration, such as the darker color of chelicerae, cephalothorax and third legs, it differs in the armature of the pedipalps, the metatarsus bearing along each inferior edge a series of five spines instead of four, with numerous cylindrical setae intervening instead of these being absent. It also differs in the more pronounced ridge on the upper finger of the chelicerae above. It differs similarly from the South American *A. geniculata* (C. L. Koch). It approaches the Central American *A. stolli* (Pocock); but the tibia of the pedipalps bears cylindrical setae beneath (female) instead of their being absent, the eyes are more widely separated, the ocular tubercle lacks the median pale stripe, the abdomen is not colored below the longitudinal furrow on each side, etc.

Ammotrecha tabogana, sp. nov.

Chelicerae above and laterally dusky over yellow with a dark line along each side above and a middorsal dark line, ventrally yellow; fingers rufous proximally, dark or blackish distally. Cephalothorax dusky over a yellow ground, with the color deeper, more solid, over the anterior and lateral borders, and a dark line running from the dark border at each antero-lateral corner mesocaudad to a median longitudinal pale line. Eye tubercle black, not divided by a longitudinal pale line. Abdomen pale yellow to dark grayish yellow excepting a stripe on each side above the longitudinal furrow composed of a series of dark, chocolate-brown spots, the color of the latter not at all extending below the furrow. Femur of pedipalps yellow, more or less darkened distally; tibia, metatarsus and tarsus abruptly darker, dusky

to nearly black. First and second legs yellow. Third legs with femur dusky or brown, yellow beneath at proximal end; tibia dusky or brown, yellowish at distal end; metatarsus also brown, yellow at distal end. The fourth legs with femur darker brown, yellow proximally beneath; tibia more blackish, yellow at both ends but the distal yellow annulus the larger; metatarsus also dark with a yellow annulus at each end. The anterior end of cephalothorax semicircular as usual. Eyes between one-half and three-fourths their diameter apart. Eye-tubercle in front with a number of spines of which two are longer and stouter than the others. Metatarsus of pedipalps along each edge beneath with a series of five stout and moderately long spines between which and over ventral surface generally are numerous cylindrical setae in part of equal and in part of greater length than the spines, with fewer very long, fine-tipped forms. Tibia with cylindrical setae beneath on distal half. Upper finger of chelicerae bearing beneath three large teeth on the anterior base of the most caudal of which is a much smaller tooth or denticle, the three major teeth being followed by three or four small teeth; this finger along dorsal edge with a ridge which is highest opposite the third, or caudal, large tooth. Lower finger having typically two large teeth with a denticle between them.

Length, exclusive of chelicerae, 16 mm.

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TWO NEW CROTALINE SNAKES FROM WESTERN MEXICO.

BY E. R. DUNN.

Among the many reptiles brought back from Mexico by Nelson and Goldman were three small snakes, two rattlers and a *Lachesis*. The two rattlesnakes are obviously alike and appear to be unnamed. So likewise the *Lachesis* seems to be hitherto unknown.

In naming these new snakes after Dr. Stejneger and Dr. Barbour, I gladly take advantage of an opportunity to show my appreciation of the advice and encouragement which they have so often given me.

Lachesis barbouri, sp. nov.

Diagnosis.—A small *Lachesis* with single subcaudals, 17 rows of scales, and an enlarged frontal shield.

Range.—Omilteme, Guerrero, Mexico.

Type.—United States National Museum, No. 46,347. Omilteme, Guerrero, Mexico.

Description of type specimen.—Scales in 17 rows, the first smooth, the rest keeled. Ventrals 154, anal entire, subcaudals 32 (23 single, followed by three paired shields followed again by six single ones). Tail apparently not prehensile. Supraoculars large, separated across the head by three shields of which the median is a large frontal and the lateral ones form part of a row separating frontal from supraocular. Supralabials eight left, nine right—none entering pit. Infralabials nine, three touching the one pair of genials. Two preoculars, four suboculars, two of which touch the third and fourth labials and the last two of which are separated by one scale from the labials —three postoculars. There are from one to three keels on the temporal scales. Nasal divided—one scale between preocular and nasal, a large scale in front of supraocular on top of snout. Canthus rostralis while distinct does not form an acute ridge as in *L. godmani*.

Uniform dull olive above. On the posterior fifth of the body there are indistinct light spots on the ends of the ventrals and on some of the scales

of the first three rows. These take the form of light bars four or five dorsal scale lengths apart. The scale which has the light spot also has a dark tip. On the tail these narrow cross bars extend to the mid-dorsal line. There are four such light bars on the tail, the posterior third of which is uniform and darker than the color elsewhere. The belly is very finely punctulated with light and dark. Head above same as body, an indistinct light band from eye to angle of jaw including the last four upper labials and extending more or less continuously though faintly above the edges of the ventrals through the anterior half of the body. Throat dark, last six lower labials with a vertical white bar.

Dimensions.—Length, 370 mm.; tail, 46 mm.

Remarks.—This snake merits comparison with *L. godmani* and *L. aurifer* rather than with any *Lachesis* hitherto recorded from Mexico (i. e., *lanceolatus, nummifer, lansbergii, brachystoma* and *undulatus*). It has a lower scale count than any American species.

With *aurifer* (the next lowest, with 19 scale rows) it is allied by the enlarged frontal and the ventral count. But it differs in the smaller number of subcaudals, in the two less scale rows, in the greater number of oculars, and in some being in contact with the labials, in the divided nasal, in the labials being occluded from the pit, and in coloration.

With *godmani* there is close agreement in coloration save in the peculiar throat of the new form, the subcaudal count is the same. *Godmani* sometimes has the enlarged frontal separated by one row of scales from the supraocular, the labials do not enter the pit, and the nasal is divided. But here the resemblance ends for *godmani* has 21 scale rows, a much lower ventral count, a more acute canthus rostralis and the suboculars are cut off from the labials.

It would seem that *barbouri* is a link between *godmani* and *aurifer* showing characters of both and being more primitive than either in head scalation and having (dwarfing due to altitude?) a lower number of dorsal scale rows than either.

It is interesting to note that *godmani* and *aurifer* are usually put in different sections of the genus because of the possession of a prehensile tail by *aurifer*, and these sections have been elevated at times to generic rank. *Bothriechis* Peters 1859, type *B. nigroviridis* Peters, for the arboreal, prehensile tailed forms; and *Bothriopsis* Peters 1861, type *B. quadriscutatus* Peters (=*castelnaudi* D & B fide Boulenger et Cope), for the terrestrial, nonprehensile tailed forms.

I do not believe that these divisions can be maintained on this character. *Bothriechis* is therefore the generic name for the American *Lachesis* with undivided subcaudals in case they are thought not congeneric with *L. mutus* and *L. atrox*.

Crotalus stejnegeri, sp. nov.

Diagnosis.—A small *Crotalus* with a long slender tail, a very small rattle and with the first pair of lower labials long and produced backwards broadly in contact behind the symphysial.

Range.—West coast of Mexico in Sinaloa and western Durango.

Type.—United States National Museum, No. 46,486. Plumosas, Sinaloa, Mexico; July 19, 1897. Nelson and Goldman collectors.

Description of type specimen.—Scales in 27 rows, the first smooth, the rest keeled. Ventrals 176, anal entire, caudals 44 undivided. Rattle very small, seven rings and button measuring 12 mm. long and four mm. wide.

Upper surface of snout with one large pair of internasals and a row of four prefrontals, the two outside ones in contact with internasal and surpraocular —*canthus rostralis* distinct. Supraocular shields narrower than space between them, smooth—7–9 scales between supraoculars, and 10–13 scales in contact with them. Two scales between eye and nasal. Eye separated from labials by three series of scales. Rostral in contact with nasal. Supralabials 14 L, 15 R; lower labials 16, the first pair produced backwards in contact with each other behind the symphysial and with the third lower labial, thus cutting the second lower labial from the chin shields. Color grayish-brown; a series of 40 darker brown, black-edged dorsal rhombs (the first of which is split on the neck) three scales long and on seven scale rows. Alternating with these on the ninth scale row a dark spot covering about one scale. In the same transverse plane as the dorsal rhombs dark spots covering about one scale in each of the third, fourth and fifth rows. Alternating with these a dark spot on a scale of the first row and the tip of the preceding gastrostege. Belly grayish marbled with black. Tail dull brown with indistinct dark cross-bands. Head flecked above with black, a darker brown blackedged band from beneath eye to angle of jaw. Lower half of upper labials white. Throat white, a dark spot below angle of jaw and tip of lower jaw grayish.

Variation.—A smaller specimen with a rattle consisting of button alone—United States National Museum, No. 46,460, with the same data, shows few minor variations. On one side four series of scales separate eye from labials. The second lower labial is narrowly in contact with the chin shield, thus separating the first labial from the third. The scale counts for this specimen are V 174, C 41, Sc 27, L 14/13–14. Same pattern as type. Forty-four dorsal rhombs, two elongated black spots on occiput, a dark spot which is partly on the posterior end of the supraocular and a similar spot partly on the anterior end of the same scale.

Dimensions.—Type No. 46,486. Total length, 590 mm.; tail except rattle 77 mm. No. 46,460, total length, 284 mm., tail except rattle, 33 mm.

Remarks.—This snake scarcely needs comparison with any described form. The subcaudals are more in number than in any of the described species. The shape of the tail and the minuteness of the rattle are characters which scarcely stand out on paper but which are very striking in the specimens. The peculiar shape of the first lower labial is unique, also. In pattern *stejnegeri* is remotely similar to the snakes of the *triseriatus-pricei* group, but even here the relationship is not close.

Boulenger (Cat. Snakes British Museum III, p. 580) records a specimen of *C. tigris* from Ventanas, Durango, Mexico, on the western slope of the Sierra Madre about 15 miles from the Sinaloa border and undoubtedly in

the same faunal zone as Plumosas. This snake was Boulenger's only specimen of *tigris*. It was small (380 mm.) and has the following scale count: V 181, C 46, Sc 25. I strongly suspect that it is the present species. The caudal count is far too high for *tigris*. Unfortunately it is impossible to determine how much of the description in the Catalogue of Snakes is drawn from this specimen and how much from literature. Still a comparison with the description above shows many points of resemblance and a few of discord other than the two less scale rows and the slight ventral and caudal variations. Also the following statements are not in accord with the state of affairs in *tigris*. "Snout with distinct canthus," "a large scale on each side between the internasal and the supraocular," "three series of scales between the eyes and the labials," "dark-edged spots."

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THE RELATIONSHIPS AND GEOGRAPHICAL DISTRIBUTION OF THE SPECIES AND RACES BELONGING TO THE GENUS RHYNCHOCYCLUS.

BY CHARLES B. CORY.

The following brief synopsis of the species and subspecies of the genus *Rhynchocyclus* is the result of an examination of material in the Field Museum of Natural History, supplemented by specimens borrowed from other museums in this country, and represents the writer's present views on the valid forms of this group.

GENUS **Rhynchocyclus** Cabanis & Heine.

Rhynchocyclus Cabanis & Heine, Mus. Hein., ii, 1859, p. 56 (Type *Muscipeta flaviventris* Wied).

Rhynchocyclus sulphurescens sulphurescens (Spix).

Platyrhynchus sulphurescens Spix, Aves. Bras., ii, 1825, p. 10, pl. 12, fig. I male.[1]

Rhynchocyclus sulphurescens pallescens Hartert & Goodson, Novit. Zool., XXIV, 1917, p. 414 (Santa Cruz, Bolivia).[2]

Range: Southern Brazil (Minas Geraes; Rio de Janeiro; Parana; S. Paulo; southern and southwestern Matto Grosso; Santa Catharina); Paraguay (Sapucay; Puerto San Juan); Bolivia (Mapiri; Yacniba; Rio Tapacani; Monte de Basilio, Dep. Santa Cruz); Argentina (Prov. Jujuy and Misiones).

Rhynchocyclus sulphurescens assimilis (Pelzeln).

Rhynchocyclus assimilis Pelzeln, Orn. Bras., 1869, pp. 110, 181 (Borba, Rio Madeira type locality).[3]

[1] But not fig. 2 female, which is supposed to represent *Craspedoprion olivaceus olivaceus* Temm. (*cf.* Hellmayr, Abhandl. Ak. Wiss. München, XXII, 1906, p. 643).

[2] I can not distinguish specimens from Santa Cruz, Bolivia (*pallescens* Hartert & Goodson) from those from Sao Paulo and Santa Catharina, Brazil, although one Bolivian example is somewhat paler.

[3] According to Hellmayr (*cf.* Chapman, Bull. Amer. Mus. Nat. Hist., XXXVI, 1917, p. 435).

Rhynchocyclus scotius Oberholser, Proc. U. S. Nat. Mus., XXV, 1902, p. 63 (Brazil).

Range: Brazil (Borba to Rio Madeira; Manaos, Rio Negro; Upper Rio Roosevelt and Amazonian region; Itacoatiara; Rio Tocantins; Rio Tapajoz, etc., to Para);[1] southern Venezuela (Caura River and near Mt. Duida); British Guiana (Mazaruni River); S. E. Colombia (Florencia and Buena Vista);[2] Ecuador (Sarayacu and Balzar Mts.); eastern Peru (Zeberas and Chamicuros).

Rhynchocyclus sulphurescens berlepschi Hartert & Goodson.

Rhynchocyclus sulphurescens berlepschi Hartert & Goodson, Novit. Zool., XXIV, 1917, p. 415 (Caparo, Trinidad I., W. I.).

Range: Trinidad; coast of northeastern Venezuela?[3]

Very close to *R. s. assimilis*, but all Trinidad specimens I have seen appear to have the crown more olivaceous, less grayish, than in *assimilis*.

Rhynchocyclus sulphurescens cherriei Hartert & Goodson.

Rhynchocyclus sulphurescens cherriei Hartert & Goodson, Novit. Zool., XXIV, 1917, p. 414 (Cayenne).

Range: French Guiana; Dutch Guiana.

I am doubtful as to the validity of this form. I have not seen specimens from Cayenne, but Hartert & Goodson record it also from British Guiana and Caura River, Venezuela. I am unable to distinguish birds from British Guiana and Caura River, Venezuela, from examples from Itacoatiara, middle Amazon River, and Utinga, near Para, and am, therefore, forced either to not recognize the form as separable from *R. s. assimilis* or restrict its range provisionally to French Guiana and Dutch Guiana.

Rhynchocyclus sulphurescens exortivus Bangs.

Rhynchocyclus sulphurescens exortivus Bangs, Proc. Biol. Soc. Wash., XXI, 1908, p. 163 (La Concepcion, Sierra Nevada de Santa Marta, N. Colombia).

Range: Northern and northeastern Colombia (Santa Marta region and lower Magdalena River); northern Venezuela (Colon, Tachira; Orope and Encontrados, Zulia; Caracas).

R. s. exortivus Bangs differs from *R. s. assimilis* in having the back decidedly brighter (more greenish); crown more olivaceous and throat and breast decidedly more yellowish. (Type examined.)

Rhynchocyclus sulphurescens flavo-olivaceus (Lawrence).

Rhynchocyclus flavo-olivaceus Lawrence, Ann. Lyc. Nat. Hist. N. Y., VIII, 1863, p. 8 (Lion Hill, Panama).

Range: Panama.

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[1] Recorded by Snethlage, Bol. Mus. Goeldi, VIII, 1914, p. 394. I have examined a specimen from Utinga, near Para, in the American Museum of Natural History.

[2] Not typical (*cf.* Chapman, Bull. Amer. Mus. Nat. Hist., XXXVI, 1917, p. 435).

[3] Cumaná and Puerto Cabello, Venezuela, were included by Hartert & Goodson in the range of this form. I have not seen specimens from Cumaná, but examples from the region of Puerto Cabello are certainly nearer *exortivus*.

Rhynchocyclus cinereiceps cinereiceps (Sclater).

Cyclorhynchus cinereiceps Sclater, Ibis, 1859, p. 443 (Oaxaca, S. Mexico).

Range: Southern Mexico (in states of Vera Cruz; Oaxaca; Yucatan; Quintana Roo and Chiapas); Guatemala; Honduras; Nicaragua; Costa Rica and Panama.

Rhynchocyclus cinereiceps asemus (Bangs).[1]

Rhynchocyclus sulphurescens asemus Bangs, Proc. Biol. Soc. Wash , XXII, 1910, p. 73 (Pavas, W. Colombia).

Range: Western Colombia (Pavas; Dabeiba; Puerto Valdivia; Rio Frio; Miraflores; Cali and Jimimez).

Rhynchocyclus peruvianus peruvianus Taczanowski.[2]

Rhynchocyclus peruvianus Taczanowski, P. Z. S. Lond., 1874, p. 537 (Ropaybamba, C. Peru).

Range: Central and northern Peru (except in extreme northwestern part).

Rhynchocyclus peruvianus æquatorialis Berlepsch & Taczanowski.[3]

Rhynchocyclus peruvianus subsp. *æquatorialis* Berlepsch & Taczanowski, P. Z. S. Lond., 1883, p. 556 (Chimbo and Guayaquil, W. Ecuador).

Range: Western Ecuador and extreme northwestern Peru, near boundary line (Lechugal).

Rhynchocyclus marginatus marginatus Lawrence.

Rhynchocyclus marginatus Lawrence, Proc. Acad. Nat. Sci. Phila., 1868 (1869), p. 429 (Lion Hill, Panama).

Range: Eastern Costa Rica (Carrillo; El Hogar); Panama; western Colombia (Puerto Valdivia; Barbacoas; Buena Vista; Narino).

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[1] *R. c. asemus* is similar to *R. c. cinereiceps* of Central America, but differs in having the chest more tinged with yellowish and in its larger size (average measurements of wing—*asemus* about 67 mm., *cinereiceps* 64½ mm.). It differs from *R. s. exortivus* of the Santa Marta region, etc., in its darker and grayer cap; back darker olive green; throat and chest grayer. The wing averages somewhat longer. (Type examined.) This form, to my mind, is clearly a representative of *cinereiceps* and not closely allied to *sulphurescens*. The type specimen is by far the largest of any specimens examined (wing 70 mm.), but two examples from Jiminez have the wing 67 mm. and 68 mm. Dr. Chapman, Bull. Amer. Mus. Nat. Hist., XXXVI, 1917, p. 434, calls attention to the smaller size of specimens examined from Dabeiba, Cali, Rio Frio and Miraflores, in which the wing measurements averaged 66.5 mm.

[2] *R. p. peruvianus* Taczanowski approaches *R. c. cinereiceps*, but size decidedly larger; back bright olive green; a blackish auricular spot. Type—wing 60; bill 18 mm. I have not seen this form.

[3] *R. p. æquatorialis* is similar to *R. p. peruvianus* from central Peru, but decidedly smaller and differs in having the back and edges of remiges brighter olive green; yellow area of lower belly more extensive. Type—wing 65; tail 60; bill 18. Hartert & Goodson, Novit. Zool., XXIV, 1917, p. 415, say they examined a specimen from western Ecuador and it differed from *R. c. cinereiceps* only in its slightly darker gray head and less extended gray throat, and that a Peruvian skin (no definite locality given) labelled *R. s. peruvianus* did not appear to differ from the Ecuadorian specimen. I have not seen a specimen of this form, but judging from the original description I suspect *æquatorialis* will be found to be a representative of *cinereiceps* and close to *asemus*.

Rhynchocyclus marginatus flavotectus (Hartert).[1]

Rhynchocyclus megacephala flavotecta Hartert, Novit. Zool., IX, 1902, p. 608 (San Javier type locality, and Paramba, N. W. Ecuador).

Range: Western Ecuador (San Javier; Paramba; Esmeraldas; Guayaquil, etc.).

Rhynchocyclus megacephalus (Swainson).

Tyrannula megacephala Swainson, Bds. Brazil & Mexico, 1841, p. 47, no locality given (Prov. Sao Paulo, S. Brazil).[2]

Range: Southern Brazil (Sao Paulo; Parana); southeastern Paraguay (Puerto Bertoni); extreme northeastern Argentina (Rio Siguendo; Alto Parana, Misiones).

Characters.—"Upper parts very dusky dull olive green, the feathers of sides of crown with dark centers, as a result of which two distinct blackish-brown stripes are formed, extending from the forehead to back of crown. Lores and narrow superciliary stripe olive-yellowish; sides of head olive-greenish, lined with yellowish. Lesser wing coverts olive green; the middle and greater coverts dark brown with broad reddish yellow ends, which form two distinct cross bands. Remiges dark brown; the primaries with reddish yellow outer borders (the color somewhat paler than the tips of the wing coverts). Rectrices dark brown, with olive-yellow-green outer borders. Throat and fore-neck dull olive-yellowish green; rest of under parts olive yellow. Bill dark horn brown; lower mandible with exception of tip whitish. Wing 65; tail 60; bill 15 mm."

"Another specimen from Matto Dendro, Sao Paulo, is somewhat lighter olive green above; the under parts brighter olive yellow; the fore-breast scarcely washed with olive-greenish, and size decidedly smaller. Wing 59; tail 53; bill 15. It is probably a female." (Free translation from Hellmayr, Verh. zool.-bot. Gesell. Wien, liii, 1903, p. 206.)

The specimens described above, collected by Natterer, are preserved in the Vienna Museum. They are believed by both Hellmayr and Berlepsch to be the form that Swainson's plate is intended to portray.

Rhynchocyclus poliocephalus poliocephalus Taczanowski.[3]

Rhynchocyclus poliocephalus Taczanowski, Orn. Perou, ii, 1884, p. 285 (Nauta, N. E. Peru).

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[1] *R. m. flavotectus* (Hartert) is similar to *R. m. marginatus*, but differs in its plain gray crown; more yellow throat and breast (throat grayish on chin only); edgings of wing coverts narrower. I have not seen this form, but have followed Chapman (Bull. Amer. Mus. Nat. Hist., XXXVI, 1917, p. 436, in text) in considering it a race of *marginatus*. It is given as a form of *megacephalus* by Hartert & Goodson and of *sulphurescens* by Berlepsch (Proc. IV Int. Orn. Congr. London, 1905 (1907), p. 482).

[2] Type locality Prov. Sao Paulo proposed by Hellmayr (Verh. zool.-bot. Gesell. Wien, liii, 1903, p. 206).

[3] Characters.—Cap slaty, mixed with olive green; back brighter green; under parts nearly uniform olive-yellow, somewhat paler and slightly tinged with greenish on the throat and fore-neck. Wing 52–55 mm.; tail 42–45 mm.

This group, *R. p. poliocephalus*, *R. p. sclateri* and *R. p. klagesi*, may be readily distinguished from representatives of *sulphurescens* by their smaller size (wing always less than 60). I have not seen specimens of typical *poliocephalus poliocephalus*.

Range: Northeastern Peru (Ucayali; Exberos; Pebas, Nauta; Upper Ucayali; Yurimaguas); southeastern Peru (Cosnipata); eastern Ecuador (Napo); northwestern Brazil (Teffe, upper Amazon).

Rhynchocyclus poliocephalus sclateri Hellmayr.

Rhynchocyclus poliocephalus sclateri Hellmayr, Verh. zool.-bot. Gesell. Wien, liii, 1906, p. 207 (Barra de Rio Negro, N. Brazil Manaos).

Rhynchocyclus poliocephalus (nom. nud.) Pelzeln, Orn. Bras., 1869, p. 110 (Barra de Rio Negro; Maribitanas and Bahia).

Rhynchocyclus megacephalus (nec *Tyrannula megacephala* Swainson) Sclater, Cat. Bds. Brit. Mus., XIV, 1888, p. 170 (Para, Brazil; Demerara, Merume Mts. and Carimang, British Guiana).

Range: Northern Brazil (Rio Negro and Rio Madeira and eastward in Amazon region; Rio Tapajoz; Rio Tocantins; Rio Jamunda, etc., to Para); eastern Brazil (Bahia);[1] eastern Venezuela (Lower Orinoco and Caura River);[2] British Guiana; French Guiana; Dutch Guiana.

This form is similar to *R. p. poliocephalus* from Peru, but differs in its larger size and somewhat smaller bill; by its whitish gray, instead of olive yellowish throat; grayish fore-neck (only slightly washed with olive yellowish), and paler yellowish under parts. Wing (type ex. by Hellmayr) 57½; tail 53 mm. The average wing measurements of 4 males amd 5 females from Oyapoc and Nana River, Cayenne, in the Carnegie Museum, males—wing 55; females—wing 54 mm.

Rhynchocyclus poliocephalus klagesi (Ridgway).

Rhynchocyclus klagesi Ridgway, Proc. Biol. Soc. Wash., XIX, 1906, p. 115 (Maripa, Venezuela).

Range: Upper Orinoco River, Venezuela (Maripa and foot of Mt. Duida); S. E. Colombia (La Morelia and Florencia).[3]

This form is obviously closely related to *R. p. sclateri*, but differs in its brighter yellowish belly and in its yellowish-olive tinged breast and throat. Size about that of *R. p. sclateri*. The single specimen from the foot of Mt. Duida, S. Venezuela, has the crown much darker (dusky slate color) than any specimen I have seen of either *sclateri* or *klagesi*, but otherwise agrees with *klagesi*.

Rhynchocyclus grisescens Chubb.

Rhynchocyclus grisescens Chubb, Ibis, 1910, p. 588 (Sapucay, Paraguay).

Range: Southeastern Paraguay (Sapucay).

[1] Hellmayr (Novit. Zool., XVII, 1910, p. 298, footnote) has examined the specimen in the British Museum recorded by Sclater, Cat. Bds. Brit. Mus. XIV, 1888, p. 170, as specimens "a" "Brazil" under *megacephalus*, and learned that it came from Bahia and that it proves to be this form.

[2] According to Hellmayr (Novit. Zool., XVII, 1910, p. 298, footnote) specimens recorded by Berlepsch & Hartert from La Pricion, Caura River, Venezuela, as this form, prove to be a form of *sulphurescens*. If so, they are probably *assimilis*, which also occurs in that region.

[3] Specimens in American Museum of Natural History.

"Allied to *R. sulphurescens*, but differs in being olive grey above instead of green; the head somewhat darker and inclining to lead-colour; tail-feathers pale brown, edged with whitish; quills also pale brown, margined with olive-grey. The two bars on the wings, formed by the margins of the median and greater coverts, are white instead of yellow; the throat and chest olive-grey, not yellow; the middle of the abdomen whitish, in place of yellow; the under tail-coverts buff towards the ends; the under wing-coverts white instead of yellow. Bill black above, greyish white below; tarsi and feet bluish slate coloured; iris brown. Total length 5.2 inches; culmen 0.6; wing 2.55; tarsus 0.8." (Chubb *l. c.* orig. descr.) In the same paper Chubb records *R. sulphurescens sulphurescens* from the same locality.

Rhynchocyclus flaviventris flaviventris (Wied).

Muscipeta flaviventris Wied. Beitr. Naturg. Bras. (3), ii, 1831, p. 929 (Rivers Mucuri and Alcobaca, southern Bahia, Brazil).

Rhynchocyclus flaviventris aurulentus Todd, Proc. Biol. Soc. Wash., XXVI, 1913, p. 171 (Momotoco, Santa Marta, Colombia).

Range: Northern and eastern Colombia (Santa Marta; Lower Magdalena region; Cucuta; "Bogota" region); Venezuela (Puerto Cabello; Tocuyo; Cumana; Rio Aurare; Caicara and along the middle Orinoco River, etc.); Trinidad; Tobago; British Guiana; northern and eastern Brazil (Amazonian region from about the Rio Branco, eastward to Rio Tocantins; Rio Jamunda; Para; Jua and Quixada, Ceara, and southward to Rio Araguaya, Goyaz and Rio Mucuri, Bahia).

In this group *R. f. viridiceps* and *R. f. borbæ* appear to be well marked races, but I am unable to separate the Santa Marta bird (*aurulentus* Todd) from the typical form. There is apparently considerable individual variation (either seasonal or due to difference in age) in the coloration of the under parts and borders of wing coverts, and to a somewhat lesser degree the same may be said of the coloration of the upper parts. The brightest examples are from Ceara, although I can not distinguish them from some specimens from Santa Marta, and from both of these localities a few selected specimens are unquestionably brighter than any examples I have seen from Bahia. Most of the Bahia specimens are old skins and the single fresh skin is as brightly colored as most of the Santa Marta specimens. From the material before me the differences are slight and apparently not constant. Two specimens from the Rio Branco show a slight tendency towards *R. f. borbæ*, but are much nearer *R. f. flaviventris*.

I have examined 61 specimens of this form from the following localities: Colombia (Santa Marta region, Momotoco, Bonda, etc., 18; Lower Magdalena River and Cucuta 5); Venezuela (Rio Aurare 2; Cumana 1; Suapure, Maripa and La Union 9); Trinidad 6; Tobago 3; Brazil (Bahia 7; Rio Branco region 5; Quixada and Jua, Ceara 5).

Rhynchocyclus flaviventris viridiceps (Sclater & Salvin).

Rhynchocyclus viridiceps Sclater & Salvin, P. Z. S. Lond., 1873, p. 280 (Pebas, N. E. Peru).

Range: Northeastern Peru (Pebas);? central Peru[1] (La Merced; Chanchamayo); eastern Ecuador (Rio Napo); southern Colombia (Florencia).[2]

This well marked race differs from *R. f. flaviventris* in having the upper parts decidedly darker (more olive green and less yellowish green); lores yellowish olive (without rusty tinge); lesser and median wing coverts greenish like the back; throat and breast yellowish green, like the sides, becoming clearer yellow on middle of belly. Wing 56; tail 48 mm.[3]

This form is close to *R. f. borbæ* and resembles it in coloration of lores and wing coverts, but it differs in its slightly more greenish upper parts and decidedly more greenish throat and chest (not clear olive yellow as in *borbæ*).

Rhynchocyclus flaviventris borbæ Hellmayr.

Rhynchocyclus flaviventer borbæ Hellmayr, Verh. zool.-bot. Gesell. Wien, liii, 1903, p. 208 (Borba, Rio Madeira, Brazil).

Range: Northwestern Brazil (Lower Rio Madeira; Borba; Marmellos[4] and Monte Verde, Rio Purus).[5]

This form is similar to *R. f. viridiceps* from northeastern Peru, but differs in its clear olive yellowish throat and chest (not light yellowish green as in *viridiceps*).

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[1]According to Hellmayr (Novit. Zool., XVII, 1910, p. 296) two specimens from La Merced, central Peru (preserved in the Branicki Museum) are larger, and may prove to be a different form. Wing 60½; tail 49½ and wing 63½; tail 53 mm.

[2]Chapman Bull. Amer. Mus. Nat. Hist., XXXVI, 1917, p. 436.

[3]Measurements from specimen from Florencia in the American Museum of Natural History. The measurements of the type, as given by Sclater & Salvin (*l. c.*) are wing 2.2 in.; tail 1.7 in. I have not seen a specimen from Ecuador or Peru.

[4]Hellmayr, Novit. Zool., XVII, 1910, p. 295.

[5]Snethlage, Bol. Mus. Goeldi, VIII, 1914, p. 369.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

NEW SPECIES OF COLEOPTERA (FAM. CLERIDAE) FROM THE PHILIPPINE AND NEIGHBORING REGIONS, COLLECTED BY PROF. CHARLES F. BAKER.

BY EDWARD A. CHAPIN.

The new species of Cleridae herein described form part of a collection made by Professor Charles Fuller Baker, of the College of Agriculture, University of the Philippines, Los Baños, P. I., on different islands of the Philippine archipelago and Borneo. The collection is exceptionally rich in species of the genera *Callimerus* and *Tenerus*. All of the forms characterized in this paper are referable to the tribe *Tillini*. The types are all in the author's collection.

1. **Tillus mindanensis,** n. sp.

Form and size of *T. notatus* Klug. Black, elytra with a central longitudinal brownish plagia and a transverse ivory spot on either side. Head black, punctuation very fine, almost invisible, antennae eleven segmented, strongly serrated, the three basal segments piceous. Mouthparts, except for the mandibles which are black, piceous. Thorax barrelshaped, strongly constricted behind, shining, punctures fine and sparse. Scutellum densely pubescent with white hairs. Elytra with coarse punctures in rows on the basal half, finely and irregularly punctured toward the apex. Near the scutellum, between the first and second rows of punctures there is a deep longitudinal pit, as long as two spaces between punctures. The elytra are black except for the central brown portion bounded as follows: at the base by the fourth row of punctures, thence toward the apex to about basal fourth where it is suddenly narrowed to the second row. At about the middle it suddenly widens in a triangular lateral expansion, reaching the lateral transverse ivory spot. This spot commences at the fifth row of punctures and reaches the lateral margin. The brown plagia disappears

soon after the white spot and is resumed in the form of a subapical spot, common to the two elytra. The surface bears a few upright black spine-like hairs and toward the apex is rather densely covered with pale silky pubescence. Under parts black, shining, sparsely and finely punctured. The side pieces of the metasternum are densely clothed with white silvery pubescence, as also are the lateral portions of the abdominal segments. Legs black, except for the apical halves of the tibiae and the whole of the tarsi, which are rufopiceous. Length: 5.5 mm.

Type: A female from Davao, Mindanao, P. I., C. F. Baker (Baker No. 4268).

2. **Tillus nitidicollis,** n. sp.

Similar in form and general appearance to *T. mindanensis*, but larger. Head slightly coarser and more densely punctured, epistoma with fine transverse wrinkles. Antennal segments broadly triangular, the outer angles rounded. Thorax more densely and coarsely punctured and with a very distinct subapical transverse impression. The elytra are colored quite similarly to those of the preceding species but the brown is of less extent anteriorly and much greater posteriorly. The ivory spot in this species turns sharply at its sutural end, and, filling the fifth interval completely, runs forward to the basal third. The basal portion of each elytron is gibbous and in place of the longitudinal pit, there is a dull, raised portion of somewhat greater extent. The stiff spine-like hairs are confined to the basal part and the entire surface is covered with very short fine hairs, whose color is the same as that of the portion of the elytron from whence they arise. The under parts are more roughly sculptured, especially the metathorax. The legs are similar in coloration to those of *T. mindanensis*. Length: 8 mm.

Type: A male from Sandakan, North Borneo, C. F. Baker (Baker No. 11,496).

Melanoclerus, n. gen.

Form robust, eyes moderately coarsely granulated and quite prominent. Antennae eleven segmented, very short, hardly longer than the distance between the eyes, segments nine to eleven forming a compact club, the last segment the longest. Last segment of the maxillary palpi cylindrical, somewhat acuminate, that of the labial palpi large, subtriangular, the outer side broadly rounded. Thorax barrelshaped, somewhat constricted behind. Elytra covering the abdomen, sutures closed, punctured in rows, the punctures disappearing before basal half. Abdomen with six visible ventral segments. Tarsi with five segments, all visible from above, the first four short, second, third and fourth with lamellae beneath. Claws bifurcate, the inner portion nearly as long as the outer.

Genotype: *Melanoclerus parvus*, n. sp.

This genus should be placed near *Gastrocentrum* Gorham 1876, judging from the structure of the under parts and of the claws.

3. **Melanoclerus parvus,** n. sp.

Form parallel, robust; head small; with eyes, not wider than the prothorax; black. Head finely and sparsely punctured, frons slightly impressed either side of the median line, sparsely pubescent. Antennae very short, the segments densely and finely punctured, ninth strongly transverse, tenth equal in width to ninth but somewhat longer, eleventh cultriform, as wide as the tenth and as long as the ninth and tenth together. Mouth-parts very dark piceous. Thorax longer than wide, finely margined at base, very densely and finely punctured, pubescence short and dense, with some longer hairs intermingled. Scutellum small, rounded behind. Elytra with rows of coarse punctures at base, punctures becoming obsolete just before middle. Apical half of the elytra densely and finely punctured. Pubescence short, depressed and gray, with longer erect black hairs. Under parts densely punctured and sparsely pubescent. Legs short, posterior femora not reaching posterior border of second abdominal segment, dark piceous, slightly paler at joints. Length: 4.5 mm.

Type: A female from Sandakan, North Borneo, C. F. Baker.

4. **Callimerus princeps,** n. sp.

Elongate, parallel, black; legs, antennae and mouth parts pale, more or less covered with glossy white scales. Head finely and very minutely punctured, entirely covered with scales except for the vertex and a narrow line running down onto the frons. Thorax longer than wide, dilated at the middle, broadly and shallowly impressed at the apex, narrowly and more deeply at the base. A triangular median spot, and the lateral portions are free from scales. Elytra parallel, black, deeply and coarsely punctured except along the suture at the median third of the length. Surface of the elytra between the punctures dull, alutaceous. There are seven denuded areas, one subbasal on each elytron, one median lateral on each elytron and one median central, common to the two elytra, and one subapical on each. The apices of the elytra are internally obliquely truncate, the outer angle only, mucronate. Under parts black, laterally densely covered with white scales. Legs pale testaceous, the femora showing traces of green pigment. Posterior tibiae with subapical notch. The entire surface of the beetle has, in addition to the scales, a vestiture of long, erect hairs, rather sparsely placed. Length: 7 mm.

Male.—Terminal dorsal abdominal segment dilated and bifurcate. Each ramus extends outward and downward, becoming gradually widened to the tip, which is sharply truncate. The tips of the rami are turned under toward the median line. Between the rami there is a small triangular projection.

Female.—Unknown.

Type.—A male from Basilan, P. I., C. F. Baker (Baker No. 11,534).

5. **Callimerus intricatus,** n. sp.

Elongate, parallel, slender. Bluish; antennae, mouth parts and legs testaceous; vestiture of white scales unevenly distributed over the body.

Head minutely and very sparsely punctured, vertex sparsely, rest of head densely covered with white scales. Thorax hardly dilated at sides, each side with a round deep pit as in the species of the genus *Hydnocera* Newm. Apical transverse impression hardly distinct, basal well defined. Surface shining with a few deep conspicuous punctures on the denuded areas. A central rectangular discal spot and a smaller lateral roundish spot on each side are devoid of scales. Elytra parallel, narrow, shining, coarsely and sparsely punctured, punctures irregularly placed. The pattern of white scales is in lines and consists of a basal transverse band with a posterior prolongation over each humerus, and a sutural stripe which widens as it proceeds apically and which bifurcates at about basal fourth, each ramus reaching the lateral margin. Commencing just cephalad of each ramus and crossing it are two short longitudinal stripes, each placed midway between the suture and the lateral margin and extending caudad to about the middle of the total length of the elytron, then striking backward and inward suddenly to the suture. At the apical third there is a transverse band and from this the suture is scaly to the apex. The sutural stripe widens rapidly so that the entire apices are covered with scales. Apices internally obliquely truncate, the outer angle very slightly mucronate. The under parts are blackish blue laterally covered with scales. Legs testaceous, hind tibiae with subapical notch. Length: 6.5 mm.

Male.—Unknown.

Female.—Terminal segments simple, unmodified.

Type.—A female from Sandakan, North Borneo; C. F. Baker.

6. **Callimerus bornensis**, n. sp.

Similar in size and form to the preceding. Black, legs and antennae pale testaceous, mouth parts piceous, body more or less covered with white scales. Head apparently impunctate, sparsely and evenly covered with scales, these scales a little more densely placed toward the eyes. Thorax hardly dilated, distinctly flattened above, very coarsely and moderately closely punctured, without lateral pits. Apical transverse impression very slight, basal sharply defined, distinct. A transverse, rather broad undulating band is free of scales. Elytra strongly and coarsely punctured, the intervals between the punctures dull, alutaceous. The white scales are distributed as follows: a transverse narrow basal band, an undulating band in the form of a W, in which the three upper points of the design are at the humeri and the scutellum and the two lower are at about basal third, midway between the suture and the lateral margin. Next on each elytron is a semicircle with the convexity toward the suture, these occupying about the third quarter of the length. The apices are scaly, and are internally obliquely truncate, the outer angle mucronate. Under parts as in the preceding species. Legs testaceous, posterior knees slightly darker. Posterior tibiae with subapical notch.

Length: 7.5 mm.

Male.—Unknown.

Female.—Terminal segments simple, unmodified.

Type.—A female from Sandakan, North Borneo, C. F. Baker.

7. **Callimerus hexagonus,** n. sp.

Elongate, parallel; blue, antennae, mouth parts and legs pale testaceous. Head conspicuously punctured, frons with transverse wrinkles, sparsely covered with white scales. Thorax conspicuously dilated at the sides with a prominent though shallow pit on either side at the widest part, anterior constriction shallow, posterior deeper and more definitely indicated. Sides at base and apex covered with white scales, the entire surface with rather coarse, sparse punctures. Scutellum densely scaly. Elytra long, parallel, with very coarse punctures not arranged in rows, finely alutaceous between the punctures. There is a hexagon of white scales common to the two elytra extending from just behind the scutellum to about the middle of the length. At each angle of the design, except the posterior one, the scales are extended in lines toward the nearest margin, the line from the sutural anterior angle reaching the scutellum. Behind the hexagon, from the suture obliquely in a posterior direction, nearly to the side margin, is a white mark on each elytron and there is a subapical spot or line on each. The tips of the elytra are internally obliquely truncate, both angles of the truncature mucronate. Under parts very finely punctured, the lateral portions of the thorax and abdomen covered with white scales. Legs testaceous, the inner margins of the femora and the outer margins of the tibiae infuscate. The tarsi are also darker. Posterior tibiae with subapical notch.

Length: 11 mm.

Male.—Unknown.

Female.—Terminal abdominal segments simple, unmodified.

Type.—A female from Penang, Straits Settlements, C. F. Baker.

8. **Callimerus oculatus,** n. sp.

Elongate, testaceous, tips of the elytra and flanks near the humeri darker, scales white, sparse, evenly distributed on the elytra except near tips. Head sparsely and finely punctured, white scales along the margins of the eyes, which are black and conspicuous. Thorax almost impuncate, testaceous with a trace of green pigment in places, constricted before and behind, lateral depression faint, with a few white scales low down on the sides. Elytra long, slightly narrowed posteriorly, punctures moderate in size and tending to form rows, lateral margins toward the humeri and apices dark, uniformly covered with whitish scales except for the anterior half of the apical dark spot. Lateral portions of the under parts densely clothed with white scales, median under parts finely and sparsely punctured. Legs pale testaceous, with a greenish tinge, especially noticeable on the femora. Posterior tibiae with subapical notch.

Length: 7 mm.

Male.—Unknown.

Female.—Terminal segments of abdomen simple, unmodified.

Type.—A female from Sandakan, North Borneo, C. F. Baker.

9. **Callimerus luzonicus,** n. sp.

Elongate, head and thorax dark testaceous, the latter usually distinctly greenish, elytra varying from piceous to rufotestaceous. Head shining, almost impunctate, with a few white scales near the eyes. Thorax not strongly dilated but with distinct anterior and posterior constrictions. Lateral depressions distinct, circular. Entire surface devoid of scales, though distinctly pubescent. Elytra long, parallel, piceous with the extreme base rufous to rufotestaceous with the lateral margins and tips piceous, evenly covered with white scales. Punctures moderate in size, distinctly in rows, the rows spaced more or less evenly from the suture to the side margin. Tips internally obliquely truncate, the outer angle with mucro, the inner broadly rounded. Under parts as usual with the lateral parts densely scaly. Legs pale with greenish tinge. Posterior tibiae with subapical notch.

Length: 7–8.5 mm.

Male.—Terminal dorsal abdominal very broad and deeply cut out so that the lateral horns are quite slender. These horns are bent under and are widened into hooked chisel-like blades. The center portion of the segment is slightly produced and broadly rounded.

Female.—Terminal segments simple, unmodified.

Type.—A male from Mt. Makiling, Luzon, P. I., C. F. Baker (Baker No. 11,546). Paratypes: males and females, Mt. Makiling, C. F. Baker (Baker Nos. 1655, 1656, 11,546).

10. **Callimerus fuscitarsus,** n. sp.

Elongate, slightly tapering behind. Dark testaceous, side margins of the thorax and flanks of the elytra with the tips dark. Head finely, almost invisibly punctured; smooth and shining, with a few whitish scales near the eyes. Thorax slightly dilated at sides, anterior and posterior constrictions distinct, lateral depressions round and shallow. Low down on the sides there are a few scales. Surface shining, almost impunctate. Elytra with punctures in rows, surface more or less densely covered with scales, with longer hairs intermingled. Tips of the elytra truncate, the truncature hardly oblique, the outer angles with mucro. Under parts shining, very sparsely punctured, lateral portions of thorax and abdomen densely covered with scales. Legs pale, femora with greenish tinge, posterior tarsi and tips of tibiae dark fuscous. Posterior tibiae with subapical notch.

Length: 6–7.5 mm.

Male.—Terminal dorsal abdominal segment broad and bilobed, the lobes semicircular.

Female.—Terminal segments simple, unmodified.

Type.—A male from Singapore, Federated Malay States, C. F. Baker (Baker No. 11,540). Paratypes: A male from Penang and two females from Singapore (Baker No. 11,535).

11. **Callimerus lateralis,** n. sp.

Similar in form and appearance to *C. luzonicus.* Head smooth, shining, sparsely and moderately finely punctured. Thorax somewhat dilated, an-

terior and posterior depressions distinct. Punctuation moderately coarse and sparse, the entire thorax free from scales. In the type the thorax is deeply suffused with green, traces of which appear in some of the other specimens. The elytra are long and are narrowed toward the tips. The punctures are in rows, and the fourth, fifth and sixth rows are close together, taking up space equal to the interval between the first and second. The surface is quite densely and evenly covered with yellowish white scales except for the interval between the fourth and sixth rows of punctures. The tips of the elytra are truncate, slightly obliquely, neither angle with mucro. The under parts are shining and finely punctured, densely clothed with scales along the sides. Legs pale, femora quite greenish. Posterior tibiae with subapical notch.

Length: 6–8 mm.

Male.—Terminal dorsal abdominal segment is broad and trifurcate, the three prolongations are acutely triangular and nearly of even length.

Female.—Terminal segments simple, unmodified.

Type.—A male from Basilan, P. I., C. F. Baker (Baker No. 11,530). Paratypes: A female from Basilan (same data as type); two males from Zamboanga, Mindanao (Baker No. 7279); a male from Dapitan, Mindanao (Baker No. 11,547); a female from Iligan, Mindanao (Baker No. 6077); and a female from Davao, Mindanao.

12. Callimerus basilanicus, n. sp.

Similar in size and form to *C. lateralis*. Head shining, finely and sparsely punctured, the epistoma, frons and region about the eyes thickly covered with white scales. Thorax greenish, dilated at the sides, anterior construction shallow, posterior deep, well defined. Lateral depressions round, shallow but prominent. Surface with a few fine punctures and in the vicinity of the lateral depressions with fine wrinkles. Along the sides of the disk there are a few white scales. Elytra black, punctures definitely in rows as in *C. lateralis*, well covered with scales except for the following: on each elytron near the base a rectangular patch which is continued as a fine line along the second row of punctures; the suture; the intervals between the fourth, fifth and sixth rows almost to the apex where there is a second patch; the interval between the seventh and eighth rows is also clear of scales and this stripe joins the preceding at the humerus and at the apical rectangular patch. The apices are hardly truncate, but there is a mucro at the middle of each apical margin. Under parts as in the preceding species. Legs pale, femora greenish. Posterior tibiae with subapical notch.

Length: 6.5 mm.

Male.—Terminal dorsal abdominal segment very broad, very broadly and shallowly emarginate, the lateral portions revolute. There is a slight trace of a third ramus in the form of a minute triangular projection at the middle of the emargination.

Female.—Unknown.

Type.—A male from Basilan, P. I., C. F. Baker (Baker No. 11,529).

13. **Callimerus albescens,** n. sp.

Elongate, parallel, black, almost evenly but sparsely covered with scales. Legs paler. Head black, without visible punctures, evenly and sparsely clothed with scales, these slightly more dense near the eyes. Mouth parts and antennae pale testaceous. Thorax with sides slightly dilated, with a depression just before the middle of the base, apical transverse constriction obsolete, sides with lateral depressions. Surface evenly and sparsely scaly. Elytra parallel, closed, narrowed toward tips, coarsely punctured and strongly alutaceous, almost reticulate; sparsely clothed with scales except for the humeri and a median and subapical spot on each. Tips internally obliquely truncate, neither angle mucronate. Under parts of thorax black, finely punctured, the lateral portions densely scaly. Abdomen pale brown, with dense covering of scales along sides. Legs brownish testaceous, posterior tibiae with hardly a trace of subapical notch.

Length: 8 mm.

Male.—Unknown.

Female.—Terminal abdominal segments simple, unmodified

Type.—A female from Zamboanga, Mindanao, P. I., C. F. Baker (Baker No. 6696).

14. **Callimerus fenestratus,** n. sp.

Elongate, parallel, blue, decorated with lines of white scales, antennae and legs pale. Head sparsely and distinctly punctured, except for a smooth space on the vertex. The frons and epistoma are densely clothed with white scales. The thorax is hardly dilated at the sides, the anterior constriction is very feeble, the posterior more sharply defined, submarginal. The sides of the front are densely covered with scales as is the entire base. The nude part behind the anterior constriction is very coarsely and sparsely punctured and is shiny between the punctures. In front of the anterior constriction the surface is transversely wrinkled and is minutely punctured. The elytra are parallel almost to the tip where they are suddenly narrowed. Punctuation very coarse, moderately dense. Surface between the punctures alutaceous. Color blue with white scales as follows: four transverse bands, one basal, a second at basal fourth, the third at apical two-fifths and the last subapical. These bands are connected, one to another, by longitudinal stripes. the first to the second by the suture, the second to the third by two, one on each elytron about halfway between suture and margin, and the third to the fourth by the suture. The sutural angles in all cases are rounded. Tips remotely subtruncate, without mucro. Under parts very dark piceous, laterally with scales. Legs pale testaceous, each tibia with a darker stripe. Posterior tibiae without subapical notch.

Length: 6.5 mm.

Male.—Terminal dorsal segment simple, rounded, not perceptibly widened, very slightly emarginate at tip.

Female.—Unknown.

Type.—A male from Puerto Princesa, Palawan, P. I., C. F. Baker (Baker No. 4272).

15. Callimerus arcufer n. sp.

Elongate, parallel, blue, marked with lines and patches of white scales. Head finely and quite densely punctured, rather different from the usual condition as found in this genus. Antennae short, reaching to the posterior border of the eyes, dark testaceous. Mouth parts piceous. Surface of head very sparsely clothed with scales. Thorax hardly dilated, anterior and posterior constrictions feeble, punctuation moderately coarse and quite sparse. There are four patches of scales, one on either side of the median line at both the anterior and posterior constrictions. Elytra coarsely and moderately densely punctured, the punctures not in rows. On the second quarter of the length there is a U of white scales common to the elytra. The upper ends of the figure are connected with the side margins by lines of scales. Just back of the U there is a transverse bar of scales and a second bar, somewhat wider than the first is placed subapically. The under parts are finely and sparsely punctured, the lateral portions scaly. The anterior and middle femora are pale except for a lateral dark line, the posterior femora are pale on basal half. The rest of the legs is dark. Posterior tibiae without subapical notch.

Length: 6 mm.

Male.—Unknown.

Female.—Terminal segments simple, unmodified.

Type.—A female from Penang, Federated Malay States, C. F. Baker.

16. Callimerus albus, n. sp.

Elongate, parallel, black, almost entirely covered with white scales. Head so densely clothed with scales that the surface is entirely concealed. Eyes black, very conspicuous. Antennae and mouth parts pale testaceous. Thorax somewhat dilated at sides, entirely covered with scales. Elytra black, coarsely and sparsely punctured, at least where the punctures show. Entirely and very densely covered with snow white scales except for four small, roundish spots, two median lateral and two subapical. Tips of the elytra internally obliquely truncate, the outer angle mucronate. Under parts as usual, legs pale testaceous, posterior tibiae without subapical notch.

Length: 5.5 mm.

Male.—Terminal dorsal abdominal segment entire, somewhat dilated, fringed with rather long hairs. The median part is prolonged, perhaps, a slight distance beyond the lateral portions.

Female.—Unknown.

Type.—A male from Basilan, P. I., C. F. Baker (Baker No. 11,520).

17. Callimerus flavus, n. sp.

Elongate, parallel, piceous, clothed with yellowish scales. Head and thorax much as in the preceding species, but the thorax is more depressed along the median line. Elytra piceous, punctures coarse and moderately densely placed. Surface entirely covered with scales, the scales more dense in places so as to give the impression of two transverse bars, these situated

at basal and apical thirds. Tips of the elytra separately rounded, not mucronate. Underparts almost chestnut, lateral parts densely clothed with *white* scales. Legs pale testaceous, posterior tibiae without subapical notch.

Length: 6 mm.

Male.—Terminal segment (dorsal) entire, rounded, very slightly wider than the ventral, fringed with long hairs.

Female.—Terminal segments simple, unmodified.

Type.—A male from Mt. Banahao, Luzon, P. I., C. F. Baker (Baker No. 7278). Paratype: A female from the same locality (Baker No. 8290).

18. **Callimerus terminalis,** n. sp.

Elongate, parallel, depressed, slender. Entirely pale testaceous except for the tips of the elytra and the eyes, which are black. Head almost impuncate, shining, with a few white scales near the eyes. Thorax depressed above, very slightly dilated at sides, anterior construction obsolete, posterior deep, sharply defined. There are a few large, indistinct punctures scattered over the surface. Elytra long, parallel, coarsely and regularly punctured, testaceous except for the tips which are black and densely clothed with scales. There are also a few scales at the extreme base. Tips internally obliquely truncate, the outer angle mucronate. Under parts finely rugulose, with white scales along the sides. Legs testaceous, posterior tibiae without subapical notch.

Length: 6 mm.

Male.—Unknown.

Female.—Terminal segments simple, unmodified.

Type.—A female from Sandakan, North Borneo, C. F. Baker (Baker No. 11,463).

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PROCEEDINGS

OF THE

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DESCRIPTION OF A WHIPPOORWILL FROM PORTO RICO.

BY ALEXANDER WETMORE.

Recently while identifying a collection of bird bones, secured with remains of other vertebrates in Porto Rican caves by H. E. Anthony of the American Museum of Natural History, the writer found several humeri of a whippoorwill that represented an undescribed species. A number of years ago C. B. Cory[1] recorded a whippoorwill received from Porto Rico as *Antrostomus vociferus*. No others are known to have been taken since, and this specimen has remained as the only actual evidence of the occurrence of the American whippoorwill in the West Indies. On finding the bones mentioned above it seemed probable that this specimen might be a representative of the undescribed species. Through the courtesy of Mr. Cory the skin in question (in the collection of the Field Museum of Natural History) was forwarded to Washington for study, and on examination was found to be the same as the bird discovered previously in the cave material. It may be known as

Setochalcis noctitherus, species novus.

Characters.—Similar to female of *Setochalcis vociferus vociferus* (Wilson) but wing shorter; crown, hind-neck, back and rump with paler markings largely cinnamon-rufous (less evident on crown); upper tail-coverts and dorsal surface of rectrices with lighter markings largely ochraceous-buff; throat and breast marked strongly with cinnamon-rufous; feathers of breast more heavily tipped with black; abdomen and under tail-coverts colored with light ochraceous-buff; breast marked with prominent spots of cartridge buff; light bars on under surface of rectrices indistinct; pale tips on three outer rectrices greatly restricted especially on the inner web.

[1] Auk, 1889, p. 276.

Description.—Type, No. 42,099, Field Museum of Natural History, female, taken on Porto Rico, October 29 1888, by C. P. Streator (in fall plumage):

Feathers of crown (save in center) and upper hind-neck gray, vermiculated and stippled with dusky and cinnamon-rufous, with shaft streaks of black edged narrowly with cinnamon-rufous; center of crown with feathers broadly black with narrow marginal spots and broken bars of cinnamon-rufous; a small spot of white on lores; sides of head and auricular region blackish, mixed with cinnamon-rufous; feathers of lower hind-neck barred obscurely with narrow lines of black and cinnamon-rufous, a few feathers having small terminal spots of pale ochraceous-buff, these forming an indication of a broken band; feathers of back with broad irregular markings of black along the shaft and the remainder of the web finely stippled with black and cinnamon-rufous; tertials with bold irregular, partly concealed spots of black near the tips, elsewhere vermiculated with dusky and cinnamon-rufous, becoming paler toward the base where the prevailing color is grayish white; feathers of rump and upper tail-coverts with heavy, somewhat broken black streaks along shaft, elsewhere vermiculated with black, pale ochraceous-buff and cinnamon-rufous; upper surface of rectrices with narrow, indistinct, broken cross-bars of dull black that do not extend out to margin, stippled and lined elsewhere with blackish, pinkish cinnamon and light ochraceous-buff; three outer rectrices tipped rather narrowly with light ochraceous-buff, the broadest of these pale tips measuring 6 mm. long; lesser, median, and greater wing-coverts black, stippled heavily with cinnamon-rufous, with two rather indistinct bars of light buff, formed by pale tips on lesser and median coverts; primaries blackish with numerous spots of ochraceous-salmon along inner and outer webs, these spots changing to an obscure stipple distally on the inner webs; outer webs margined narrowly for distal one-third with light buff; secondaries blackish, washed and stippled with grayish-white, ochraceous-salmon and light ochraceous-buff; throat black above with narrow, obscure cross-bars of cinnamon-rufous, below crossed by a broad, obscurely delimited band of pale ochraceous-buff, with each feather barred more or less prominently with black; feathers of upper breast with shaft streaks and narrow obscure crossbars of black, stippled heavily at the ends with cinnamon-rufous, each feather tipped with black; lower breast similar, but with prominent scattered spots of cartridge buff, obscured by faint vermiculations of dusky; feathers of abdomen, sides and flanks cartridge buff, washed with tawny, spotted and barred irregularly with dusky and dull black; under tail-coverts dull pale ochraceous-buff, barred with black; under surface of rectrices dusky, with mottlings of light ochraceous-salmon arranged to indicate faintly, lighter bars; feathers on front of tarsus dull cinnamon-rufous, barred with black; under wing-coverts light ochraceous-salmon barred with black; bill dusky; hind surface of tarsus light brown; toes dull brown; claws black (from dried skin).

Measurements (of type).—Wing 135 mm.; tail 112; exposed culmen 11; tarsus 16.3; middle toe without claw 16.

Range.—Porto Rico. (Locality where type was taken not more definitely

known; bones of this species examined from La Cueva Catedral, near Morovis.)

Remarks.—This species is most nearly allied to the typical subspecies of the eastern whippoorwill but differs from it markedly in the characters given in the diagnosis. It has less in common with the larger *Setochalcis v. macromystax* of the southwestern United States and northern Mexico or with the whippoorwill from southern Mexico and Guatemala known as *Setochalcis v. chiapensis*. The latter is large in size thus resembling *macromystax* but differs from that subspecies in being very dark above. The Cuban Whippoorwill (*S. cubanensis*), which must be mentioned by virtue of its geographic proximity, differs from *S. noctitherus* so strikingly in lack of buffy coloration on the hind neck, where there is no trace of a paler collar, much larger size, and enormously developed rictal bristles that it may be dismissed without further comment.

The longest rictal bristles of the Porto Rican Whippoorwill measure approximately 33 mm. so that they are similar in development to those of *Setochalcis v. vociferus*. The seventh, eighth and ninth primaries (counting from the inside of the wing) are narrowly sinuate toward the tips, and the front of the tarsus is feathered down to the toes. The posterior surface of the tarsus is entirely bare. The pecten on the middle claw is similar to that in the Whippoorwill of the eastern United States.

According to Mr. Ridgway[1] fifteen specimens of *Setochalcis vociferus vociferus* gave the following measurements (in millimeters): wing 147–163 (155.3); tail 105–123.5 (116); exposed culmen 10–14 (12.5); tarsus 16–18 (16.6); middle toe 16–17.5 (16.5). (Females.)

It will be noticed that the Porto Rican Whippoorwill agrees closely with *Setochalcis vociferus vociferus* in length of tail, culmen, tarsus and middle toe. It is therefore a bird of somewhat similar size in body to the eastern Whippoorwill but has a much shorter wing. The latter character is a development usual in species of insular range, where there is no need for extended migrations with changing seasons. An extended alar surface is of value to a bird performing long journeys as with it less effort is required to maintain position in the air in overcoming the pull of gravity. Where this need is obviated there may easily be a reduction in wing surface, as indicated by length of wing. In species like the Whippoorwills that secure their prey by making short sallies in the air in pursuit of flying insects this reduction, while noticeable, would of necessity be less than in forms of less active habit.

The species described herewith is probably nearly extinct, if indeed it is not actually in that category. During ten months' field work in Porto Rico in 1911 and 1912 the writer saw one goatsucker that may possibly have belonged to the present species, but failed to secure it. Though he was in residence in the country districts during the greater part of this period these birds were not heard calling, nor were they mentioned directly by the natives who were cognizant of most of the birds of the island. As Whippoorwills are terrestrial in habit the decrease of the present form may be attributed to the mongoose, scourge of ground haunting vertebrates, a species that was introduced here about 1872.

[1] Birds of North and Middle America, U. S. Nat. Mus., Bull. 50, Vol. VI, 1914, p. 517.

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PROCEEDINGS

OF THE

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MUTANDA ORNITHOLOGICA.

VIII.

BY HARRY C. OBERHOLSER.

Some further changes in the names of birds prove necessary.[1] Five given below concern species in the families Pittidae, Hirundinidae, Muscicapidae, Prionopidae, and Tangaridae.

Family PITTIDAE.

Pitta atricapilla Lesson.

The *Pitta atricapilla* of Lesson,[2] now in current use for a Philippine species of *Pitta*, is antedated by *Turdus sordidus* Müller,[3] which was applied to the same species. Its name should, therefore, now be *Pitta sordida* (Müller).

Family HIRUNDINIDAE.

Riparia paludicola sinensis (Jerdon).

The *Hirundo sinensis* of Jerdon,[4] which is now employed for an Asian swallow as *Riparia paludicola sinensis*, is debarred by *Hirundo sinensis* Gmelin,[5] applied to some other and unidentifiable species. It should, therefore, be called *Riparia paludicola chinensis* (Gray).[6]

[1] For the seven previous articles in this series, *cf.* Proc. Biol. Soc. Wash., XXX, March 31, 1917, pp. 75–76; July 27, 1917, pp. 125–126; *ibid.*, XXXI, May 16, 1918, pp. 47–49; November 29, 1918, pp. 125–126; *ibid.*, XXXII, February 14, 1919, pp. 7–8; April 11, 1919, pp. 21–22; June 27, 1919, pp. 127–128.

[2] Traité d'Ornith., 1831, p. 394 (Manila, Philippine Islands).

[3] Vollständ. Natursyst. Suppl., 1776, p. 143 (Philippine Islands).

[4] Madras. Journ., XI, 1840, p. 238 (Jaulnah, India).

[5] Syst. Nat., I, ii, 1789, p. 1021 (China).

[6] *Hirundo chinensis* J. E. Gray, in Hardwicke, Illustr. Ind. Zool., I, 1830, pl. XXXV, fig. 3 (China).

FAMILY MUSCICAPIDAE.

Stoparola melanops (Vigors).

The use of *Muscicapa melanops* Vigors[1] for the Indian bird commonly known as *Stoparola melanops* is interdicted by *Muscicapa melanops* Vieillot,[2] which is now known as *Trichothraupis melanops* (Vieillot) (olim *Trichothraupis quadricolor* [Vieillot]). The next available name for *Stoparola melanops* is *Muscicapa thalassina* Swainson,[3] and this species, since *Stoporala* is the correct spelling of its generic name,[4] will, therefore, now stand as *Stoporala thalassina* (Swainson).

FAMILY PRIONOPIDAE.

Hemipus obscurus (Horsfield).

The *Muscicapa obscura* of Horsfield,[5] which is now *Hemipus obscurus* (Horsfield), is unavailable for use in this connection, because of the prior *Muscicapa obscura* Gmelin,[6] which is the *Phaeornis obscura* (Gmelin) of modern ornithologists. For the proper name of *Hemipus obscurus* (Horsfield) we must, therefore, turn to *Muscicapa hirundinacea* Temminck,[7] and now call the species *Hemipus hirundinaceus* (Temminck).

FAMILY TANGARIDAE.

Tachyphonus rufiventris (Spix).

The South American tanager described by Spix as *Tanagra rufiventer*,[8] must be rechristened, since its present name is invalidated by *Tanagra rufiventris* Vieillot,[9] now known as *Tanagra rufiventris* Vieillot (olim *Euphonia rufiventris* [Vieillot]). The difference in the spelling of the specific name *rufiventer* Spix and that of *rufiventris* Vieillot is merely that of the difference in gender, *rufiventer* being the masculine and *rufiventris* the feminine nominative, and as such of course identical. Since *Tanagra rufiventer* Spix is thus left without a tenable name, it may be called **Tachyphonus metallactus,** nom. nov.

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[1] Proc. Zool. Soc. Lond., 1831 (March 2, 1832), p. 171 (Himalaya Mountains).
[2] Nouv. Dict. d'Hist. Nat., XXI, 1818, p. 452 (Paraguay).
[3] Nat. Hist. Flycatchers, 1838, p. 252 (India).
[4] *Cf.* Oberholser, Proc. Biol. Soc. Wash., XXXII, April 11, 1919, p. 47.
[5] Trans. Linn. Soc. Lond., XIII, May, 1821, p. 146 (Java).
[6] Syst. Nat., I, ii, 1789, p. 945 (Hawaiian Islands).
[7] Nouv. Rec. Planch. Col. d'Ois., III, livr. 20, March, 1822, pl. 119 (Java).
[8] Avium. Spec. Nov. Bras., II, 1825, p. 37, pl. L, fig. 1 (Para, Brazil).
[9] Nouv. Dict. d'Hist. Nat., XXXII, 1819, p. 426 (Brazil).

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

TWO NEW SPECIES OF PLANTS FROM CUBA.[1]

BY PAUL C. STANDLEY.

In a small collection of plants of the families Amaranthaceae and Allioniaceae, obtained recently in Cuba and forwarded for determination by the New York Botanical Garden, are two apparently new species which are described below.

Achyranthes crassifolia Standl., sp. nov.

Stems branched, probably prostrate, the branches stout, when young densely covered with straight, appressed, smooth or slightly hispidulous hairs, glabrate in age; leaves linear or linear-oblanceolate, sessile or nearly so, 7–18 mm. long, 1–2.5 mm. wide, narrowed to the base, acute at the apex, fleshy, glabrate, the margins revolute; heads axillary, sessile, solitary or glomerate, 4–8 mm. long, about 4 mm. in diameter, the flowers yellowish white; bracts and bractlets half as long as the sepals or shorter, broadly ovate, sparsely pilose; sepals broadly ovate, 2.5 mm. long, obtuse or acutish, 3-ribbed, short-mucronate, pilose, especially near the base; stamen tube very short, the staminodia minute or wanting; utricle less than half as long as the calyx.

Type in the herbarium of the New York Botanical Garden, collected on the seashore near Santiago de Cuba, Cuba, March, 1919, by Brother Clement (No. 152).

Related, apparently, to *A. halimifolia* Lam., a species with broad leaves and more copious pubescence.

Torrubia insularis Standl., sp. nov.

Branches slender or stout, grayish or pale brown, rimose and lenticellate, glabrous except at the nodes, there minutely puberulent; leaves opposite, the petioles slender, 1–1.8 cm. long, 0.5–1 mm. thick, glabrous, the blades lanceolate to lance-elliptic, 4.5–9 cm. long, 0.8–3 cm. wide, acutish to acuminate at the base, usually acuminate or long-acuminate at the apex but sometimes acute or subobtuse, broadest at or below the middle, subcoriaceous, concolorous, glabrous, the lateral nerves 7–9 on each side, slender, subarcu-

[1] Published by permission of the Secretary of the Smithsonian Institution.

ate, the veinlets inconspicuous; pistillate peduncles 2.5–4.5 cm. long, very slender, glabrous or nearly so, the inflorescence cymose-paniculate, 1–2 cm. broad, lax, rather few-flowered, the branches glabrous, the bracts and bractlets minute, the flowers sessile and glomerate; pistillate perianth tubular, 3–4 mm. long, constricted below the mouth, very minutely puberulent or glabrous.

Type in the herbarium of the New York Botanical Garden, collected at Caleta Grande, Isle of Pines, Cuba, August 19, 1919, by Roig and Cremata (No. 1857A). Also collected at Hato Nuevo, Punta del Este, Isle of Pines, August 13, 1919, by the same collectors (No. 1790).

Related to *T. linearibracteata* (Heimerl) Standl., of Yucatán, but differing in its minute bracts. *Torrubia fragrans* (Dum.-Cours.) Standl., a widely distributed West Indian species, is somewhat similar in general appearance, but its leaves are mostly broadest above the middle and they have numerous lateral nerves.

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PROCEEDINGS

OF THE

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A NEW SUBSPECIES OF PRUNELLA MODULARIS FROM THE PYRENEES.

BY FRANCIS HARPER.

During a week's collecting in the Pyrenees in April, 1919, the writer secured several examples of the Hedge Sparrow (*Prunella modularis*). These appear, upon examination, to represent an undescribed race, which may be known as follows:

Prunella modularis mabbotti,[1] subsp. nov.

Subspecific characters.—Distinguishable at a glance from both *Prunella modularis modularis*, of central Europe, and *P. m. occidentalis*, of the British Isles, by the much grayer, less rufescent coloration of the back and wings (tae edgings of the feathers of these parts buffy brown and smoke gray instead of cinnamon-brown, as in the two other forms mentioned).[2]

Type locality.—At timber-line (altitude about 1700 meters) on a mountain about three kilometers south of Saillagouse, Dept. of Pyrénées-Orientales, France.

Type specimen.—No. 256755, U. S. National Museum; adult male; collected April 24, 1919, by Francis Harper.

Geographic range.—Specimens examined only from the Departments of Pyrénées-Orientales and Ariège, France; probably restricted, at least during the breeding season, to the Pyrenees and adjacent parts of southern France and northern Spain.

Description of type.—Pileum and nape mouse gray, broadly but very indistinctly streaked with olive-brown; scapulars and interscapulars with broad mesial streaks of black, and edged with buffy brown and smoke gray; rump and upper tail-coverts olive-brown; tail fuscous; wings fuscous, the exposed edges of the feathers buffy brown (paler on the tertials); median and greater coverts slightly tipped with whitish; malar and auricular regions olive-brown, finely streaked with whitish; under parts mouse gray, lighter

[1]Named for Douglas Clifford Mabbott, an American ornithologist, who fell in the cause of human liberty near Thiaucourt, France, on September 15, 1918.

[2]Colors given herein are those of Ridgway (Color Standards and Color Nomenclature 1912).

on chin, and changing to whitish on middle of belly; sides and flanks washed with buffy brown, and streaked with fuscous.

Measurements of type.—Length (skin), 150 mm.; wing, 68.5; tail, 57.5; exposed culmen, 10.5; tarsus, 20.5; middle toe without claw, 14.5.

Remarks.—From the available material in the U. S. National Museum selection has been made, for purposes of comparison, of four specimens of *P. m. modularis* from France, Switzerland, and Norway, six specimens of *P. m. occidentalis* from England, and three specimens (in addition to the type) of *P. m. mabbotti* from the Pyrenees. As far as can be judged from this material, the streaks on pileum and nape are much more distinct in *occidentalis* than in *modularis* and *mabbotti*. The sides and flanks in Pyrenean specimens are conspicuously less rufescent than in British and Norwegian specimens, and somewhat less so than in specimens of *modularis* from France and Switzerland. In British specimens the tarsus and middle toe average slightly longer, and the bill slightly stouter, than in specimens of the two races from the Continent.

In form of wing the Pyrenean bird appears somewhat intermediate between *modularis* and *occidentalis*.[1] In the type specimen the second primary is about 2.5 mm. longer than the seventh, while in a paratype from the same locality (No. 256648, U. S. N. M.) the second and seventh primaries are approximately equal. The average difference in length between these primaries in the specimens of *modularis* is about 4 mm., and in the specimens of *occidentalis*, less than 1 mm.

Prunella modularis mabbotti appeared to be a rather common and characteristic bird in late April in the belt of pine forest on the intermediate mountain slopes near Saillagouse.

Specimens examined.—Total number, 4,[2] as follows:

France: Saillagouse, Dept. of Pyrénées-Orientales, 3; l'Hospitalet, Dept. of Ariège, 1.

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[1] *Cf.* Hartert, British Birds, III, 1910, 314.

[2] Collection U. S. Nat. Mus.

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OF THE

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A NEW AMPHIPOD PARASITIC ON A CRINOID.[1]

BY CLARENCE R. SHOEMAKER.

Several male specimens of this Amphipod were discovered by Mr. Austin H. Clark imbedded in the discs of the Crinoid *Iridometra melpomene* taken by the "Albatross" in the China Sea at a depth of 100 fathoms. In general appearance they closely resemble G. O. Sars' species *Laphystiopsis planifrons* taken off the coast of Norway; but upon closer examination several differences are to be observed.

Family LAPHYSTIOPSIDAE.

Laphystiopsis iridometrae, new species.

Preliminary description.—Eyes (in the alcoholic specimens) without pigment and consisting of a few visual elements under the surface of the convex sides of the head. First and second antennae not differing much in length, first with 12 segments in the flagellum and the second with 10 Peraeopods proportionately shorter and stouter than in *L. planifrons* and no spines on the fifth and sixth segments of the fifth peraeopods. The first four pairs of side-plates produced conspicuously forward. The first three abdominal segments each with a low, blunt, dorsal keel. Fourth abdominal segment without dorsal keel. Telson less oval and more heart-shaped than in *L. planifrons* and in the normal position extends back to about one-third the length of the rami of the third uropods.

Length.—5 mm.

Locality.—China Sea, Albatross Station No. 5310, depth 100 fathoms.

Type.—Cat. No. 49599, U. S. N. M.

[1]Published by permission of the Secretary of the Smithsonian Institution.

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OF THE

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TWO NEW LANDSHELLS FROM CALIFORNIA.[1]

BY PAUL BARTSCH.

The United States National Museum has received two sets of landshells from Mr. Herbert N. Lowe, collected at Pt. Reyes, California, which prove to be undescribed races of Epiphragmophora tudiculata and Epiphragmophora californiensis.

In order to determine these, it was necessary to subject the members of both of these species to a critical examination, the results of which will be published in a paper now in preparation in which figures of the two new subspecies described below will be given.

Epiphragmophora tudiculata awania, new subspecies.

Shell very small, elevated helicoid dark horn colored, streaked with fine retractively slanting lines of brown and an occasional dark varicial streak. There is also a slender brown spiral band present at the periphery, which is edged on either side by a lighter zone. Nuclear whorls one and a half feebly wrinkled and obsoletely granulose. Postnuclear whorls well rounded, appressed at the summit, marked by coarse retractively slanting wrinkles, the last one and a half turns being decidedly malleated. The middle whorls show a few fine spiral striations near the summit. Base inflated, strongly rounded, marked by the continuation of the axial wrinkles and strong malleations. Aperture large, subcircular, oblique; peristome slightly expanded and reflected, white; interior of the aperture pale brown, when viewed directly, horn colored when seen by transmitted light, showing the peripheral band and the two lighter zones bordering it.

The type, Cat. No. 336,831 U. S. N. M., and two specimens were collected by Mr. Herbert N. Lowe, on the steep southern slope at the extreme west end of Pt. Reyes, California, under plants of *Mesembranthemum* in May, 1918. The three specimens yield the following measurements:

[1]Published by permission of the Secretary of the Smithsonian Institution.

No. Whorls.	Altitude.	Greater diameter.
5.3	13.4	16.4 Type
5.3	12.0	15.9
5.3	13.4	15.8

Epiphragmophora californiensis miwoka, new subspecies.

Shell of medium size, pale horn colored, extreme apex a little lighter than the rest, marked at the periphery by a chestnut band which is not bordered by lighter zones. Nuclear whorls small, one and a half, finely wrinkled and minutely papillose. Postnuclear whorls strongly rounded, the summit of the succeeding turns falls slightly anterior to the peripheral dark band of the preceding turn, so that this appears in the suture. The whorls are crossed by coarse wrinkles which are decidedly retractively slanting. Between these wrinkles are finer threads which are granulose, the long axes of the granules corresponding in disposition with the lines of growth. In addition to this a few obsolete incised spiral lines are present near the summit. The last turn has all these sculptural elements and in addition is strongly malleated. Periphery and base somewhat inflated, strongly rounded, the latter narrowly umbilicated and marked by coarse wrinkles, but here the fine papillations on the lesser wrinkles are much enfeebled excepting immediately behind the aperture, where they are equally strong. Aperture large, oblique, broadly oval; peristome expanded and partly reflected, white; interior of aperture bluish white, showing the peripheral color band within.

The type, Cat. No. 336,832, U. S. N. M., and ten specimens of this species were collected by Mr. H. N. Lowe at Pt. Reyes, Calif., in May, 1918. Five of these taken at random yield the following measurements:

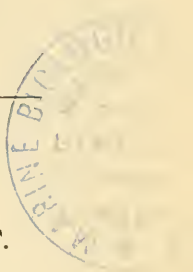
No. whorls.	Altitude.	Greater diameter.
6.2	17.1	22.1 Type
6.8	18 2	21.0
6.4	17.7	20.8
6.1	15.9	20.8
6.6	16.5	22.2

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NEW SHELLS FROM THE NORTHWEST COAST.

BY WILLIAM HEALEY DALL.

The following forms are included by name in my forthcoming summary of the fauna of the Northwest coast and it becomes necessary to validate these names by descriptions.

Leda lomaensis, new species.

This form is closely related to *L. minuta* Fabricius, and I have hesitated to give it specific rank, but it differs from that species by the following characters: the shell is thinner and more compressed; the escutcheon is narrower and longer and less emphatically impressed; the sculpture rises in sharp thin low lamellae, especially on the posterior area, which contrast with the thicker, blunter and more irregularly distributed ridges of *L. minuta*. There are about eight large and seven crowded small anterior teeth, a narrow oblique resilifer and about twenty, nearly all well developed posterior teeth. Length 13.5; height 6; diameter 4 mm. The low inconspicuous beak is five millimeters behind the anterior end. U. S. N. Mus. Cat. No. 208,872. U. S. Fish Commission station 4339, off Point Loma, California, in 241 to 369 fathoms, muddy bottom.

Lucinoma annulata densilirata, new variety.

The typical *L. annulata* has the concentric sculpture rather regularly and widely spaced; this variety has it closely crowded and less lamellose, giving a different aspect to the shell, which otherwise does not differ from the typical *annulata*. Length 54; height 50; diameter 25 mm. U. S. N. Mus. Cat. No. 108,819. Harbor of Sitka, Alaska, at station 92, in ten fathoms, mud and shell, W. H. Dall.

Venericardia nodulosa, new species.

Shell small, rotund, inflated, solid, creamy white, with 13 to 15 radiating, strong, transversely nodulous ribs; the surface is also concentrically finely lineated in the interspaces which are narrower than the ribs; the beaks are prominent, there is a lanceolate small lunule in front of them, but the es-

cutcheon is linear or absent; the right valve has a large central and a small lamellar cardinal tooth on each side of it; there are two rather weak left cardinals; the interior margins are conspicuously fluted in harmony with the external sculpture. Length 11; height 10; diameter 6 mm. U. S. N. Mus. Cat. No. 211,887, U. S. Fish Commission station 2901, off Santa Rosa Island, California, in 48 fathoms, mud, bottom temperature 55° F.

This is close to the fossil *V. monilicosta* of Gabb, which is a larger shell with less emphatic nodulation, a larger lunule and one or two more ribs on the average.

Lora babylonia, new species.

Shell small, whitish, turrited, with about six whorls, the nucleus defective, the suture distinct, not appressed; spiral sculpture of a strong keel at the shoulder and on the base four or five feeble threads, the canal without spiral sculpture; axial sculpture of (on the last whorl about 18) rounded riblets retractive behind the keel, protractive in front of it, straight, forming a nodule at the intersection with the keel and with wider interspaces; aperture short and wide, simple, the anal sulcus coinciding with the end of the keel. Height 11, diameter 4 mm. U. S. N. Mus. Cat. No. 214,192. U. S. Fish Commission station 3346, off Tillamook Bay, Oregon, in 786 fathoms, sand, bottom temperature 37.3° F.

Æsopus sanctus, new species.

Shell small, light pinkish brown, with somewhat less than five whorls, of which one is composed of a globose smooth nucleus; suture distinct, the whorls moderately convex, the aperture simple, short, the columella smooth, twisted, shorter than the outer lip, the whole surface minutely evenly spirally striated. Height 4.3; of last whorl 2.0; diameter 1.6 mm. U. S. N. Mus. Cat. No. 308,958. Todos Santos Bay, near San Diego, California.

Petaloconchus montereyensis, new species.

Shell yellowish white, closely irregularly loosely coiled, occurring in masses, the sculpture of crowded concentric wrinkles with, on the earlier part of the shell, an occasional obscure longitudinal ridge; the internal lamellae occur only in the earlier coils, the later portion shows no traces of them; the maximum diameter at the aperture is two millimeters. U. S. N. Mus. 334,650. Monterey, California.

Tritonalia interfossa beta, new variety.

Shell resembling *T. barbarensis* Gabb but stouter and without the recurved spines at the shoulders; reddish brown, of more than five whorls, the nucleus defective, the whorls somewhat turrited by an angular shoulder; axial sculpture of (on the last whorl six including the terminal varix, on the penultimate whorl seven) angular ribs, prominent at the shoulder and extending to the canal; these are crossed by about 14 densely imbricate spiral cords, subequal and equally spaced, with narrow interspaces; terminal varix heavy. Aperture small, the margin continuous, the outer lip with four or five low denticles internally, the pillar smooth, the canal closed, rather short.

Height 22; of last whorl 16; diameter 10 mm. U. S. N. Mus. Cat. No. 46,728. Monterey, California, Stearns.

Nodulus palmeri, new species.

Shell minute, translucent brownish with a blunt apex and four well rounded whorls; the suture rather deep, the surface smooth except for faint incremental lines; base imperforate, aperture lunate, simple, the margin entire and continuous Height 2, diameter 0.75 mm. U. S. N. Mus. Cat. No. 212,731. St. Paul Island, Bering Sea; W. Palmer.

Cryptonatica aleutica, new species.

Shell large, rounded, slightly flattened in front of the suture pinkish white, covered with a light brownish, spirally minutely striated periostracum, a white area surrounding the umbilical region; whorls six or more, the nucleus minute; aperture lunate, simple, the body with a coat of enamel, the umbilicus completely, smoothly filled with a semilunate pad of callus; operculum solidly calcareous, smooth, with an obscure swelling centrally. Height 46; diameter 40 mm. U. S. N. Mus. Cat. No. 217,156. Unalaska, Aleutian Islands.

This is the shell which has long been confounded with and distributed under the name of *Natica russa* Gould, but the discovery of Gould's type shows that it is a much smaller and different species.

Skeneopsis alaskana, new species.

Shell minute, resembling *S. planorbis* Fabricius, but smaller, more elevated and with a much smaller umbilicus; whorls two and a half, pale greenish white, rounded, suture deep, not appressed; sculpture only of more or less evident concentric fine wrinkles, more conspicuous on the top of the whorl; aperture circular, simple, umbilicus deep, width about one-fifth of the diameter of the last whorl; operculum horny, multispiral. U.S. N. Mus. Cat. No. 271,717. St. Paul Island, Bering Sea; A. G. Whitney.

Pantellaria, new genus.

Type *Megerlia monstruosa* Scacchi.

In this group the opening for the pedicel in intact specimens is wholly in the flat or sessile valve, as in *Platidia;* when a portion of it appears to involve the other valve it is due to wear. These two genera are unique in this respect in the group. *P. echinata* Fischer and Oehlert also belongs to this genus. The species are West African, Mediterranean and Antillean.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

DESCRIPTIONS OF PROPOSED NEW BIRDS FROM PERU, BOLIVIA, BRAZIL, AND COLOMBIA.[1]

BY FRANK M. CHAPMAN.

Continued study[2] of the birds collected by the Yale University-National Geographic Expedition to the Urubamba region of Peru, and, incidentally, of other collections received by the American Museum from South America, has led to the conclusions presented in the following pages. The color terms employed are those of Ridgway's "Color Standards and Color Nomenclature" (Washington, 1912).

I acknowledge, gratefully, the loan of specimens for comparison from the Museum of Comparative Zoology, through the courtesy of Mr. Outram Bangs.

Micropus peruvianus, new species.

Specific characters.—Resembling *Micropus andecolus* (Lafr. & d'Orb.), but tail shorter, less deeply forked, white areas of the plumage without buffy tints, forehead darker, basal under tail-coverts with much less white.

Type.—No. 145,007, Am. Mus Nat. Hist., ♀ ad., Ollantaytambo, alt. 9700 ft., Peru, July 22, 1916; F. M. Chapman.

Description of type.—General coloration fuscous, the wings and tail with olivaceous reflections; sides of the nape white more or less tinged with dusky; auriculars dusky; rump white; upper tail-coverts like the back; outer tail-feathers lacking the greenish lustre of the others and paler basally; inner secondaries paler than outer quills and faintly tipped with whitish; under wing-coverts dusky, the smaller ones browner; under parts white, the sides and flanks more or less dusky; longer lower tail-coverts fuscous, shorter ones white basally, broadly tipped with dusky or fuscous; depth of tail-furcation 12.5 mm.

[1] See also "Descriptions of Proposed New Birds from Peru, Bolivia, Argentina, and Chile." Bull. Am. Mus. Nat. Hist., XLI, 1919, pp. 323–333.

[2] Published by permission of the Trustees of the American Museum of Natural History.

Description of male.—The male resembles the female in color and in size.

Specimens examined.—*Micropus peruvianus. Peru*: Type locality, 1 ♂, 1 ♀; Huaracondo Cañon, 10,000 ft., 1 ♂, 1 ?; Torontoy, 8000 ft., 2 ♀.

Micropus andecolus. Bolivia: Parotani, 8800 ft., Prov. Cochabamba, 2 ♂; Vinto, 8600 ft., Prov. Cochabamba, 2 ♂. *Argentina:* Tilcara, 8000 ft., Prov. Jujuy, 1 ♂; Angaco Sud, 2000 ft., Prov. San Juan, 2 ♂, 1 ♀; Mendoza, 1.

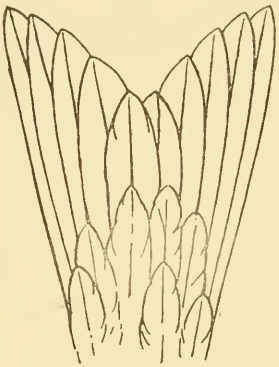


FIG. 1.—Tail of *Micropus peruvianus.*

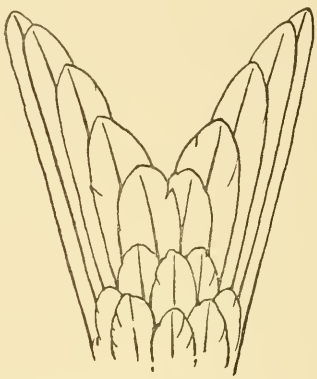


FIG. 2.—Tail of *Micropus andecolus.*

(Both natural size.)

Remarks.—The type-locality[1] of *Cypselus andecolus* is the Andes of La Paz, Bolivia. I have no specimens from La Paz, but faunal considerations lead me to believe that four specimens from the Andes at Cochabamba may be accepted as typically representing this bird. That the describers did not mention the buffy tint which characterizes our Bolivian and Argentine specimens is not surprising since it might well be considered as adventitious. While their figure of the species does not therefore show a buffy tint on the white areas, it does show a more deeply forked tail than is exhibited by any of our Peruvian birds, and this in spite of the fact that it is somewhat smaller than natural size.

Although the characters separating the Peruvian and Bolivian birds seem to me to be of specific value, the birds nevertheless are obviously representative forms, and it is not probable, therefore, that both would be found at the same locality. If this be true, there can be little doubt of the essential identity of the La Paz and Cochabamba birds. The latter agree minutely with specimens from Argentina, and if my belief that Cochabamba specimens are typical of *andecolus* is correct, it of course follows that "*Apus andecolus dinellii*" of Hartert, from Jujuy and Mendoza, Argentina, is a pure synonym of *andecolus* (Lafr. & d'Orb.). Hartert writes (Bull. B. O. C., XXIII, 1908, p. 43): "The measurements of this species [=*dinellii*] are the same as in *A. a. andecolus,*" indicating that the birds which he identified as *andecolus* are not the same as the bird from Peru which I here describe.

[1]The type is not in the Museum of Comparative Zoology at Cambridge.

The appended measurements show the constancy of the differences in length and depth of furcation of the tail in the two forms, characters on which, chiefly, I base my belief of their specific distinctness.

MEASUREMENTS.

Place.	Sex.	Wing.	Tail.	Depth of fork.
Ollantaytambo, Peru	♂[1]	134	54	13
Huaracondo Cañon, Peru	♂[1]	136	54	14
Vinto, Prov. Coch., Bol.	♂[2]	143	66.5	22.5
" " "	♂[2]	139	67	
Parotani " "	♂[2]	143	66.5	19.5
" " "	♂[2]	141	64	19
Angaco Sud, Prov. San Juan, Arg.	♂[2]	138	64	20
" " " "	♂[2]	142	64	23
Mendoza, Argentina	♂[2]	144.5	67	21.5
Torontoy, Peru	♀[1]	131	54	13
" "	♀[1]	134	56	14
Ollantaytambo, Peru	♀[1]	139	54	12.5
Angaco Sud, Prov. San Juan, Arg.	♀[2]	140	61	22

Grallaria watkinsi, new species.

Specific characters.—Resembling *Grallaria ruficapilla albiloris* Tacz., but crown paler, more sharply defined from back, and with buff shaft-streaks, back more olivaceous and usually with fine shaft-streaks; ear-coverts dusky, tarsi and toes (in dried skins) pale brown, not dark blackish brown; wing and tail averaging shorter, tarsus and bill longer.

Type.—No. 163,084, Am. Mus. Nat. Hist., ♂ ad., Milagros, 2200 ft., Prov. Piura (near Prov. Tumbes), Peru, July 7, 1919; H. Watkins.

Description of type.—Crown and nape bright ochraceous-tawny, clearly defined from the Saccardo's olive of the back and rump; forehead tipped with black, the feathers, except in the center, basally white; whole anteorbital region white, sharply tipped with black; ring around eye white, more or less tipped with black; auriculars dusky, basally white and with traces of buffy on the shafts; wings and tail of much the same color as the back; feathers of the crown and back with buff shafts; the rump with white shaft-streaks; lower wing-coverts and inner webs of wing-quills (except outer primary) deep ochraceous-buff; under parts white, faintly tinted with buff, throat immaculate; malar streaks blackish and sides of the throat streaked with blackish; breast, sides and flanks widely margined with the color of the back, bordered internally, especially on the sides and flanks, with a narrow black line and, particularly on the breast, with rusty ochraceous; center of the belly and lower tail-coverts practically unmarked; tibiae brownish olive externally, whitish internally; tarsi and toes pale brownish; maxilla black; mandible horn color.

Description of female.—The female resembles the male in size and color.

Specimens examined.—Grallaria watkinsi. Peru: Type locality, 5 ♂, 1 ♀; Alamor, 1 ♂.

[1] *Micropus peruvianus.*

[2] *Micropus andecolus.*

Grallaria ruficapilla albiloris. Peru: Levanto (near Chachapoyas), 1 ♂; Tabaconas (near Huancabamba), 1 ♀.

Grallaria ruficapilla ruficapilla. Ecuador: Zaruma, Prov. Loja, 1 ♀; "Ambato," 1; Gualea, 1 ♂, 1 ?; *Colombia:* 16 specimens of both sexes.

MEASUREMENTS.

	Wing.	Tail.	Tarsus.	Culmen.
Grallaria watkinsi[1]	93.5–96	49–53	50–55	24–25
Grallaria ruficapilla albiloris[2]	99.5	62	46	23
Grallaria watkinsi[3]	92	52	51	24
Grallaria ruficapilla albiloris[4]	96	55	51	24
Grallaria ruficapilla ruficapilla[5]	95	49	47	23

Remarks.—Our material clearly indicates the intergradation of *ruficapilla ruficapilla* with *albiloris*. Of the latter, a specimen from Levanto, near Chachapoyas, received by us from von Berlepsch and labeled by him "*Grallaria albiloris,*" may be considered topotypical of that form, since Taczanowski himself records specimens from near Chachapoyas (Orn. Perou, II, p. 83). Callacate, the type-locality of *albiloris,* is on the western slopes, Levanto on the eastern slopes of the Marañon Valley.

A specimen from Tabaconas, Peru, further north on Amazonian drainage, has more black on the breast, less white on the lores, and a darker crown than the Levanto bird, and thus shows a definite approach toward *ruficapilla,* while a specimen from Zaruma, Prov. Loja, has the white lores of *albiloris,* but in other respects agrees with *ruficapilla.* The lores are whitish also in a Gualea specimen, and in two from Ricaurte, southwestern Colombia. Taczanowski (*l. c.*) comments on the resemblance of west Ecuadorian specimens to *albiloris,* and we may, I think, accept the intergradation of that race and *ruficapilla* as essentially proven.

I dwell somewhat upon this fact for it has an interesting bearing on the status of the bird here described. Zaruma, whence comes the specimen of *ruficapilla* mentioned above, is only about sixty miles from Milagros, the type-locality of *watkinsi,* but the latter is less like the Zaruma bird than it is like the Levanto specimen from the Marañon Valley. Milagros is on the Pacific slope of the Western Andes, Zaruma on the eastern side of the same range. Whether the two localities are connected faunally, I am unable to say, but the specimens from Milagros show characters which suggest the complete segregation of a form which, while representing *Grallaria ruficapilla,* is specifically distinct from it. It gives me peculiar pleasure to dedicate this interesting new bird to its collector, Mr. Harry Watkins, who for nearly twenty years has devoted himself to zoological research in Peru, and who for the past three years has been the efficient representative there of the American Museum of Natural History.

1 5 males from Milagros, Peru.
2 1 male from Levanto, Peru.
3 1 female from Milagros, Peru.
4 1 female from Tabaconas, Peru.
5 1 female from Zaruma, Ecuador.

Grallaricula boliviana, new species.

Specific characters.—Most nearly resembling *Grallaricula costaricensis,* but not closely related to any known species. Throat ochraceous streaked with black, a white breast-patch; lower breast ochraceous, the feathers sharply margined with black, giving a scaled appearance, much as in *Premnoplex guttata.*

Type.—No. 137,177, Am. Mus. Nat. Hist., ♂ ad., Incachaca, 7700 ft., Prov. Cochabamba, Bolivia, May 16, 1915; Miller & Boyle.

Description of type.—Upper parts between brownish olive and light brownish olive, the crown with darker centers, sides of the forehead basally ochraceous; lores and a narrow eye-ring ochraceous, minutely tipped with black; tail fuscous, the outer feathers externally margined with olive-brown; wings fuscous, externally margined with olive-brown, the inner margins of all but the outer quills ochraceous-buff; under wing-coverts, bend of the wing and outer margin of alula deeper; ear-coverts tinged with cinnamon-brown; throat ochraceous, loosely streaked with black; a narrow white breast-patch; a broad ochraceous band across the lower breast, the feathers sharply bordered with black; flanks more olivaceous, with some buffy feathers obscurely margined with blackish: center of the abdomen white; tibiae brownish olive; lower tail-coverts buffy; feet dark brown; maxilla brownish black; mandible yellowish. Wing 60; tail 28; tarsus 21; culmen 12.5 mm.

Specimens examined.—*Grallaricula boliviana,* the type. *Grallaricula costaricensis,* Costa Rica, 1; Veragua, 1.

Remarks.—The discovery of this very distinct species introduces a new type of coloration into the genus *Grallaricula,* and extends the known range of the genus from Ecuador to Bolivia, a distance of approximately 1000 miles. Doubtless this gap will in time be filled by the discovery of one or more species of these elusive little birds in Peru.

Synallaxis stictothorax piuræ, new subspecies.

Subspecific characters.—Similar to *Synallaxis stictothorax stictothorax* Scl., but back more rufescent; wings more widely margined with bright cinnamon-rufous, this color occupying all the outer web of the inner primaries and both webs of the secondaries basally; tail almost wholly cinnamon-rufous, the blackish area, which occupies all the inner web of the four central rectrices in *stictothorax,* reduced to a small, faint, terminal patch.

Type.—No. 163,085, Am. Mus. Nat. Hist., ♀, Chilaco, near Samate on the Rio Chira, Prov. Piura, Peru, May 27, 1919.

Specimens examined.—*Synallaxis stictothorax piurae. Peru:* Type locality, 1 ♂, 3 ♀, 1 ?; Samate, Prov. Piura, 1 ?.

Synallaxis stictothorax stictothorax. Ecuador: Bahia de Caraque, Prov. Manavi, 5; Guayaquil, 4 (topotypes); Daule, 1; Puna Island, 6; Machala, 1.

Remarks.—Some specimens of *stictothorax stictothorax* have the secondaries basally rufous, but this character is apparently never so highly developed as in *piuræ* in which the wing, when closed, appears to be almost

wholly rufous. The characters shown by the tail are pronounced and constant, all our sixteen specimens of *stictothorax* having the inner vanes of the four central feathers black or blackish, a mark which has almost disappeared in our specimens of *piuræ*. The Machala specimen is clearly referable to *stictothorax* and brings the known range of this form almost to the Peruvian boundary. It is probable that the areas occupied by the two races are divided by the Cerro de Amotape.

Phacellodomus striaticeps griseipectus, new subspecies.

Subspecific characters.—Throat and breast grayish vinaceous-buff, instead of being essentially pure white; flanks and abdominal region much deeper, the former nearly ochraceous-tawny; ear-coverts and sides of the neck grayer, less cinnamon-rufous; upper parts averaging darker, with less cinnamon-rufous, especially anteriorly.

Type.—No. 145,210, Am. Mus. Nat. Hist., ♂ ad., July 2, 1916; Tica-Tica, 11,500 ft., near Cuzco, Peru. F. M. Chapman.

Specimens examined.—Phacellodomus striaticeps griseipectus. Peru: Type locality, 5; La Raya, 1; Calca, 2; Cuzco, 5; Anta, 1; Huaracondo Cañon, 1.

Phacellodomus striaticeps striaticeps. Bolivia: Cuchacancha, 11,000 ft., 7; Parotani, 8800 ft., 4; Vinto, 8600 ft., 3. *Argentina:* Tilcara, 8000 ft., Prov. Jujuy, 2; Tafi del Valle, 7000 ft., Prov. Tucuman, 3.

Remarks.—Our excellent series of *Phacellodomus striaticeps* shows that the characters on which this proposed new race is founded are both pronounced and constant. The marked differentiation in the color of the under parts is evidently not due to the earthy stain which often is found upon the feathers of these and other ground-inhabiting species of this family. Earth-stained birds are found in the series of both forms, and its presence in no way obscures the real characters by which they may be distinguished.

Hylocryptus, new genus.

Generic characters.—A typically furnariine bird; the difference in length between the inner and outer toes less than the difference between the latter and the middle toe; the nostril-entrance oval, non-operculate; apparently most nearly related to *Automolus* but with a longer, proportionately more slender bill, the gonydeal angle barely evident, the maxilla as well as mandible terminally decurved; the culmen from base decidedly longer than tarsus, its depth at the gonydeal angle less instead of more than three times its length from nostril. Type, *Hylocryptus erythrocephalus.*

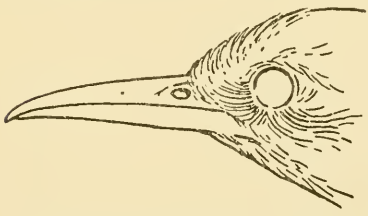


Fig. 3—Bill of *Hylocryptus erythrocephalus.* (Natural size)

Hylocryptus erythrocephalus, new species.

Specific characters.—In general coloration somewhat suggesting the *Automolus rubiginosus-A. nigricauda* group, but whole head and neck sharply defined in color from rest of the body; under parts grayish olive, etc.

Type.—No. 163,086, Am. Mus. Nat. Hist., ♀ ad., Alamor, 4300 ft., Peruvian-Ecuador boundary, July 14, 1919; H. Watkins.

Description of type.—Head all around, including nape, cheeks, auriculars, and throat between Sanford's brown and orange-rufous (throat more ochraceous-orange) clearly defined, especially on the nape and sides of the neck, from the Dresden-brown back and pale grayish olive under parts; rump tinged with orange-rufous passing into pure orange-rufous on the upper tail-coverts; rectrices slightly deeper in tone than head; wing-quills externally somewhat duller with a faint olivaceous tinge; inner webs and tips of primaries (all but base of outer ones) blackish; inner quills and wing-coverts wholly orange-rufous; bend of the wing and under wing-coverts ochraceous-orange; flanks and ventral region washed with the color of the back; lower tail-coverts ochraceous-orange; feet brownish black; maxilla dark brown, lighter terminally; mandible horn color. Wing 92; tail 83; tarsus 28; hind toe 21; outer toe 19.50; middle toe 26.5; inner toe, 17 (all with nail); culmen from base, 30; bill from nostril, 22; depth at gonydeal angle 6.5 mm.

Description of immature female.—A not fully adult female from Paletilla agrees in size with the type and differs in color only in the presence of narrow blackish terminal margins on the feathers of the occiput and under parts.

Specimens examined.—Hylocryptus erythrocephalus. Alamor, 1 ♀ ad., Paletilla, 1 ♀ ad., 1 ♀ im.

Automolus rubiginosus, A. rufipectus, A. cinnamomeigula, A. nigricauda, and other less nearly related species of the genus.

Remarks.—The type of coloration shown by this species is unlike that of any furnariine or dendrocolaptine bird known to me. It is conceivable, however, that an intensification of color which would obscure the contrast between the colors of the head and body, might produce some such result as appears in *Automolus nigricauda nigricauda* of western Ecuador. The latter, however, is a true *Automolus* of the *A. rubiginosus-A. rufipectus* group, with the bill no longer than the tarsus and with an ascending instead of decurved gonys; the tail-feathers, furthermore, are slightly stiffer.

Xenops rutilus connectens, new subspecies.

Subspecific characters.—Intermediate between *Xenops rutilus rutilus* Licht., and *Xenops rutilus heterurus* Cab. & Hein., with the tail-pattern of the former and the general coloration of the latter.

Type.—No 137,347. Am. Mus. Nat. Hist., ♂ ad. Todos Santos 1300 ft., Prov. Cochabamba, Bolivia, July 27, 1915; Miller & Boyle.

Specimens examined.—Xenops rutilus connectens. Bolivia: Type locality, 3; Yungas 3600 ft., Prov. Cochabamba, 1.

Xenops rutilus rutilus. Brazil: Chapada, 15; near Corumbá, 2; São Paulo, 1.

Xenops rutilus heterurus. Colombia: 24. *Trinidad:* 1. *Ecuador:* Zaruma, 6; Naranjo, 1. *Peru:* Idma, 2; San Miguel Bridge (Urubamba Cañon), 3; San Miguel River, 1.

Xenops tenuirostris. Brazil: Barão Melgaco, Matto Grosso, 2; Rio Roosevelt, 1 (heretofore known only from the type).

Remarks.—This is a most interesting link between *Xenops rutilus rutilus* of Brazil, and *X. r. heterurus* of the Andes from southern Peru northward and northern South America. Like true *rutilus* it has only one pair of tail-feathers with the inner web wholly (or almost wholly) black. It differs from true *rutilus,* however, in being more olivaceous and more narrowly streaked below, in having the back darker, the crown black and more finely streaked. In general color characters it therefore resembles *heterurus,* but has only one pair instead of two pairs of rectrices, largely black.

Xiphorhynchus triangularis bangsi, new subspecies.

Subspecific characters.—Similar to *Xiphorhynchus triangularis triangularis* (Lafr.), but general coloration, particularly of the upper parts, slightly less olivaceous, more rufescent; the bill largely whitish or horn-color, usually black only at the base and end of the maxilla; the buffy markings on the crown larger, the back with buffy shaft-streaks; the rump more rufous; the throat and markings of the under parts white; the markings of the breast smaller and not extending to the abdomen, which is narrowly streaked instead of spotted; under tail-coverts with fine, instead of broad shaft-streaks.

Type.—No. 137,388, Am. Mus. Nat Hist., ♀ ad., Yungas, alt. 3600 ft., Prov. Cochabamba, Bolivia, June 10, 1915; Miller & Boyle.

Range.—Subtropical zone of the eastern slope of the Andes in Bolivia and in Peru, at least north to Garita del Sol.

Specimens examined.—Xiphorhynchus triangularis bangsi. Bolivia: Yungas, type locality, 1; Locotal, 5800 ft., 1. *Peru:* San Miguel Bridge, Urubamba Cañon, 2; San Miguel River, 4500 ft., Urubamba Cañon, 1; San Miguel Road, 6000 ft., 1; Idma, above Sta. Ana, 5000 ft., 1.

Xiphorhynchus triangularis triangularis. Colombia: 34 specimens including the type and topotypical series. *Ecuador:* Zamora, Prov. Loja, 4.

Remarks.—Mr. Hellmayr's belief[1] that the type of Lafresnaye's "*Dendrocolaptes triangularis*" came from Bogotá, not Bolivia, as stated in the original description, is confirmed by an examination of Lafresnaye's type, now in the collection of the Museum of Comparative Zoology (No. 77,147; Lafr. Coll., No. 2275), whence it has been loaned me by Mr. Bangs. On the original label the words "Colombie, Bogota," are written over the word "Bolivia." Lafresnaye having discovered the error in the alleged type-locality apparently corrected it on the label of the type as he did also in his monograph of the group to which the bird in question belongs (Rev. Mag. Zool., 1850, p. 419). The type is faded and the bill is broken, but

[1] Hellmayr, P. Z. S., 1911, p. 1153, foot-note.

the extension of the large spots on the breast to the abdomen at once marks it as belonging to the Colombian form. The differences which distinguish birds from Bolivia and southern Peru from Colombian and Ecuadorian specimens are evidently shown, in part at least, by specimens from Garita del Sol on the Amazonian slopes of the Andes, east of Lima, Berlepsch (P. Z. S., 1896, p. 376) remarking that a pair of birds from this locality resemble specimens from Bolivia. He also here comments on the characters shown by the Colombian bird and, misled by Lafresnaye's statement that the type of *triangularis* came from Bolivia, he described the Colombian form as "*D. triangularis bogotensis*," a name which is obviously a pure synonym of *Xiphorhynchus triangularis triangularis*.

Since four specimens from Zamora, in southeastern Ecuador, are essentially typical of true *triangularis*, it is evident that if this form intergrades with *bangsi* it must do so between Zamora and Garita del Sol. It seems particularly appropriate to name this strongly marked race in honor of Mr. Outram Bangs, not alone in recognition of the services he has so long rendered neotropical ornithology, but also because his studies of the Lafresnaye types now in the collection of which he has charge, have already thrown, and promise to continue to throw, much light on problems which only a study of the type concerned can solve.

Thripobrotus layardi madeiræ, new subspecies.

Subspecific characters.—Similar to *Thripobrotus layardi layardi* (Scl.), but ground color of the under parts browner; its streaks somewhat narrower and tinted with buff; the unspotted throat area smaller and buffy instead of white; the abdomen less streaked. Wing 95; tail 78.5; culmen 27 mm.

Type.—No. 148,455, Am. Mus. Nat. Hist., ♂ ad., Porto Velho, Rio Madeira, Brazil, April 3, 1915; Collins-Day Exp., Geo. K. Cherrie.

Specimens examined.—Thripobrotus layardi madeiræ. Brazil: Type locality, 2 ♂; Barão Melgaco, Gy-Parana, Brazil, 1 ♀ im.

Thripobrotus layardi layardi. Brazil: Utinga, near Para, 1 ♂, 1 ♀ (topotypes).

Thripobrotus fuscicapillus. Bolivia: Todos Santos, Rio Chapare, Prov. Cochabamba, 1 ♂. *Peru:* Astillero, Rio Tambopata, 1 ♀; Rio Cosireni (lower Urubamba), 1 ♂.

Remarks.—Hellmayr (Verh. Orn. Gesell. Bayern, XI, 1912, p. 161), after comparing Peruvian specimens with the type of *Thripobrotus fuscicapillus* (Pelz.), considers them inseparable from that species and, accepting this conclusion as valid, it is clear that our birds from Porto Velho are not referable to that form, which is represented in our collections by three examples. Nor does the material at hand indicate intergradation of *fuscicapillus* with *layardi* through the race here described, which, although slightly approaching *fuscicapillus*, is nevertheless much nearer to *layardi*.

A female from Barão Melgaco, on the Gy-Parana, still wears most of the juvenal plumage. The forehead and sides of the head are spotted with fulvous, the nape and sides of the hind head are slightly streaked with the same color. The under parts agree in general tone of color, but are less sharply streaked and the central stripes are whiter. Doubtless because

of its immaturity, this bird is considerably smaller than any of our other specimens of this group. Wing 85; tail 73; culmen 25 mm.

Thripobrotus warscewiczi bolivianus, new subspecies.

Subspecific characters.—Similar to *Thripobrotus warscewiczi warscewiczi* Cab. & Hein., of Peru, but ground-color of under parts somewhat more olivaceous, its central stripes broader, margined laterally, but not terminally, with black; throat appreciably buffier and without blackish margins; maxilla paler.

Type.—No. 137,393, Am. Mus. Nat. Hist., ♂ ad., Incachaca, 7700 ft., Prov. Cochabamba, Bolivia; May 14, 1915; Miller & Boyle.

Range.—Subtropical Zone in Bolivia.

Specimens examined.—Thripobrotus warscewiczi bolivianus. Bolivia: Type locality, 4 ♂, 4 ♀; Miguelita, 5000 ft., Prov. Cochabamba, 1 ♂, 1 ♀; Locotal, 5800 ft., Prov. Cochabamba, 1 ♂, 2 ♀; "Yungas," 6000 ft., 1.

Thripobrotus warscewiczi warscewiczi Cab. & Hein. *Peru:* San Miguel Bridge, 5000 ft., Urubamba Cañon, 1 ♀.

Thripobrotus warscewiczi æquatorialis (Menegaux). *Peru:* Alamor, 4300 ft., Prov. Tumbes, 1♂; *Ecuador:* Zaruma, Prov. del Oro, 1 ♀, Gualea, Prov. Pichincha, 2 ♂, 1 ♀. *Colombia:* Ricuarte, Nariño, 1 ♂.

Thripobrotus lacrymiger lacrymiger and *T. l. sancta-martæ,* adequate series from Colombia.

Remarks.—I have to thank Mr. C. B. Cory for comparing our specimens of *Thripobrotus warscewiczi* with specimens of *T. w. warscewiczi* in the Field Museum from Molinapampa, and hence topotypical of *peruvianus* Tacz. (P. Z. S. 1882, p. 28, Tamiapuma, Peru). Mr. Cory writes that he considers our specimen from the Urubamba Cañon "to be nearly or quite typical *warscewiczi*" and this name is evidently therefore applicable to all the birds of this species from Peru with the possible exception of those found near the Bolivian boundary, which may be nearer *bolivianus,* and those from the Ecuadorian boundary, which, our Alamor specimen indicates, are nearer *æquatorialis.* Mr. Cory also calls my attention to the description by Menegaux of the Ecuador form as *æquatorialis* (Rev. Franç. d'Orn., 1912, p. 389, Cayandeled, Ecuador), which I overlooked when writing of specimens from southwestern Colombia and Gualea, Ecuador (Bull. A. M. N. H., XXXVI, 1917, p. 423). These birds, with others from Zaruma and Alamor, are decidedly more rufous, both above and below, than true *warscewiczi,* and show that *æquatorialis* is a valid, if but slightly differentiated race.

In pattern of marking the Bolivian form here described (as remarked in the paper just referred to), resembles *T. l. sancta-martæ,* but the latter is more rufous throughout and the throat as well as central stripes below are ivory white.

Mecocerculus subtropicalis, new species.

Specific characters.—Similar to *Mecocerculus stictopterus tæniopterus* (Cab.) but back greener, cap grayer and less sharply defined from nape,

wing-coverts whiter and broader, ear-coverts grayer, superciliary less extended posteriorly, abdominal region more yellow; size smaller.

Type.—No. 273,007, U. S. Nat. Mus., ♂ ad., San Miguel Bridge, 5000 ft., subtropical zone, Urubamba Cañon, Peru; June 22, 1915; E. Heller.

Description of type.—Whole crown neutral gray, spreading on to the nape and not sharply defined from the Kronberg green ("olive-green") back; a white superciliary reaching to behind the eye; lores dusky; cheeks and ear-coverts grayish white, the latter tipped with the color of the sides of the nape; tail hair-brown, very narrowly margined externally with the color of the back; the outer web of the outer pair of feathers paler basally, no trace of whitish on the inner web of any of the rectrices; wing-quills fuscous, margined with whitish on the inner webs and pale greenish on the outer webs. Median and greater coverts broadly margined with greenish white; lesser wing-coverts the color of the back; bend and lining of the wing citron-yellow; throat and upper breast grayish white, the rest of the under parts whiter, washed, or faintly and obscurely streaked, with pale citron-yellow, brighter on the sides and flanks; feet and bill black, the maxilla pale basally. Wing 60; tail 56; tarsus 16.5; culmen 9 mm.

Description of female.—The female resembles the male in color, but is smaller in size. Wing 58; tail 51; tarsus 16.5; culmen 9.

Specimens examined.—Mecocerculus subtropicalis. Peru: Type locality, 1 ♂, 2 ♀, 1 ?; Idma, 1 ♂, 2 ♀.

Mecocerculus stictopterus tæniopterus. Peru: Above Torontoy, 10,700 ft., 1 ♂, 1 ♀; Oceobamba Valley, 9100 ft., 1 ♂.

Mecocerculus stictopterus stictopterus. Ecuador: Chimborazo, 1 ♂; *Colombia:* Temperate Zone, 6 ♂, 1 ♀.

Mecocerculus hellmayri. Bolivia: Incachaca, 3 ♂, 2 ♀.

Remarks.—The apparent abundance of this proposed new species prompts the belief that it has been before described but if this be true, it was presumably not referred to the genus *Mecocerculus*. On the other hand, it is so clearly a member of that genus that it could not well be placed in any other. Possibly the lack of a clear conception of its zonal relationships with *M. s. tæniopterus* may have led to the belief that it was not separable from that species. Inaccurate labeling might readily lead to the belief that both birds came from the same locality, whereas *tæniopterus* is found in the Temperate Zone and *subtropicalis* in the Subtropical Zone.

Both *M. colopterus* and *M. pœcilocercus* have the inner web of certain remiges white; while in *M. hellmayri* and *M. minor* the wing-bars are ochraceous; in *subtropicalis* the inner webs of the rectrices are without white and the wing-bars are greenish white.

Anæretes agraphia, new species.

Specific characters.—Quite unlike any described species of the genus, but most nearly resembling *Anærctes agilis* Sel., from which it differs in having no streaks above or below, the crest wholly black, etc.

Type.—273,008, U. S. Nat. Mus., ♀ ad., Idma, 9000 ft., near Sta. Ana, Peru; October 10, 1915, E. Heller.

Description of type.—Crown and elongated feathers of the crest shining

black without white markings; a well-marked white superciliary; back olive-brown, unstriped; the sides of the nape and neck grayer; ear-coverts gray; a dusky postocular stripe; tail strongly graduated, brownish fuscous margined with the color of the back and tipped with whitish; wing-quills darker, the inner ones margined externally with the color of the back; throat whitish; breast grayish; abdominal region and flanks pale sulphur-yellow; under parts unmarked except for a slight suggestion of stripes on the breast. Wing 54; tail 58; tarsus 18.5; culmen 11; width of bill at base 4.5 mm.

Specimens examined.—Anæretes agraphia. Peru: The type.

Anæretes agilis. Colombia: near Bogotá, 3; Valle de las Pappas, 1. *Ecuador:* Mindo, 1; Gualea, 2; Pichincha, 1.

Remarks.—This is the second known member of that section of the genus *Anæretes* of which *A. agilis* has heretofore been the only described species. Compared with *A. parulus* these birds evidently possess well-marked generic characters, but the differences in question are in part bridged by *A. nigricristatus* in which the bill is broader, the tail more graduated, than in *parulus;* while *A. flavirostris* is, in respect to these characters, intermediate between *nigricristatus* and *parulus.*

Mionectes striaticollis columbianus, new subspecies.

Subspecific characters.—Most nearly related to *Mionectes striaticollis poliocephalus* (Tsch.) of Peru, but smaller; the upper breast olive-green rather than gray; the white streaks of throat and breast much narrower and more restricted; the plumbeous of the crown less extended, not reaching back of nape or ear-coverts. ♂, wing, 63–70; tail, 48–52 mm.

Type.—No. 133,683, Am. Mus. Nat. Hist., ♂ ad., Sta. Elena, 9000 ft., Antioquia, Colombia, November 21, 1914; Miller & Boyle.

Specimens examined.—Mionectes striaticollis columbianus. Colombia: Type locality, 1; east of Palmira, Cen. Andes, 1; El Roble, Cen. Andes, 2; La Candela, Cen. Andes, 3; Cerro Munchique, W. Andes, 1; San Antonio, W. Andes, 1; Subia, near Bogotá, 1.

Mionectes striaticollis poliocephalus. Peru: San Miguel Bridge; Urubamba Cañon, 3; Idma, above Sta. Ana, 6.

Mionectes striaticollis striaticollis. Bolivia: Locotal, Prov. of Cochabamba, 5; Yungas, Prov. Cochabamba, 4; Incachaca, Prov. Cochabamba, 2.

Remarks.—The receipt of an adequate series of specimens of the Peruvian form of *Mionectes striaticollis* confirms my expressed belief that the Colombian bird is separable from it (Bull. Am. Mus. Nat. Hist., XXXVI, 1917, p. 448).

The extremes of variation are represented by the Bolivian bird at the south, the Colombian bird at the north. Between these, but, as might be expected, nearer the former than the latter, is the Peruvian form which is sufficiently distinct from *striaticollis* to stand as a separate race, distinguished chiefly by its less streaked under parts, including the lower tail-coverts.

Myioborus melanocephalus bolivianus, new subspecies.

Subspecific characters.—Similar to *Myioborus melanocephalus melanocephalus* (Tsch.) of Peru, but under parts paler, lemon-chrome rather than light cadmium; frontal band narrower and often mixed with black; the outer tail-feathers with more white, the white area on the inner vane of the terminal half of the third feather (from without) larger than the black area; wing averaging shorter; bill longer; wing 67; tail 67; culmen 10.5 mm.

Type.—No. 137,927, Am. Mus. Nat. Hist., ♂ ad., Incachaca, 7700 ft., Prov. Cochabamba, Bolivia; May 24, 1915; Miller & Boyle.

Specimens examined.—Myioborus melanocephalus bolivianus. Bolivia: Type locality, 5 ♂, 11 ♀.

Myioborus melanocephalus melanocephalus. Peru: San Miguel Bridge, Urubamba Cañon, 5 ♂, 4 ♀; Torontoy, 1 ♂, 4 ♀; Santo Domingo, 6 ♂, 1 ♀; Oconeque, 1 ♂.

Remarks.—Specimens from Santo Domingo and Oconeque in southeastern Peru are intermediate. In the color of the under parts they are nearer *bolivianus,* but in tail characters they agree with true *melanocephalus.*

Basileuterus luteoviridis superciliaris, new subspecies.

Subspecific characters.—Similar to *Basileuterus luteoviridis luteoviridis* (Bonap.) of Colombia, but averaging slightly smaller, with a longer bill, rictal bristles more developed; the entire upper parts decidedly browner, the yellow superciliary much broader, brighter, in some specimens broader even than in "*Myiothlypis*" *nigrocristatus,* when it leaves an olive-green area on the crown about equal to the black area in the crown of that species. Differing from *Basileuterus luteoviridis striaticeps* Cab., and from *B. l. signatus* Berl. & Stolz. through the lack of even a trace of black on the forehead and crown, which is exactly concolor with the back; from specimens of *signatus* which lack black on the crown, it differs as it does from true *luteoviridis* and, furthermore, in being larger; wing 69.5; tail 57; culmen 12 mm.

Type.—No. 273,009, U. S. Nat. Mus., ♂ ad. Above Torontoy, 14,000 ft., Urubamba Cañon, Peru; May 14, 1914, E. Heller.

Specimens examined.—Basileuterus luteoviridis superciliaris. Peru: Type locality, 3; Cedrobamba, 12,000 ft., 1.

Basileuterus luteoviridis luteoviridis. Colombia: 4.

Basileuterus luteoviridis signatus. Peru: San Miguel Bridge, Urubamba Cañon, 5000 ft., 4 ♂, 2 ♀; Torontoy, 7800 ft., 2 ♂, 4 ♀; Santo Domingo, 6000 ft., 4; Oconeque, 1. *Bolivia:* Incachaca, 7700 ft., Prov. Cochabamba, 5.

Remarks.—This form is apparently a Temperate Zone representative of *Basileuterus luteoviridis signatus* which occurs on the same mountains in the Subtropical Zone. Its zonal relations are presumably with "*Myiothlypis*" *striaticeps* Cab.,[1] described from Maraynioc, in the humid Temperate Zone, east of the Junin region. The latter, however, is larger and is described as having "einen breiten schwärzlich olivenbraunen" stripe

[1] J. f. O., 1873, p. 316.

on the crown bordering the yellow superciliary, whereas in *superciliaris* the crown and forehead are of exactly the same color as the back. It is, however, interesting to observe that three of our sixteen Peruvian specimens of *signatus* from the Subtropical Zone show this character of a dusky stripe on the sides of the crown above the yellow superciliary, and this feature is more pronounced and more constant in five specimens from the Subtropical Zone of Bolivia.

This character clearly suggests relationship with "*Myiothlypis*" *euophrys*, the Bolivian representative of *nigrocristatus*, and this, in turn, raises the question of the status of *Myiothlypis* as a genus. The case has an important bearing on the problem of the origin of zonal faunas, and I trust to return to it at a later day with both increased material and added field experience.

Pheucticus uropygialis terminalis, new subspecies.

Subspecific characters.—In the comparative absence of black markings on the sides and flanks, and in the large size of the white endings of the greater wing-coverts, resembling *Pheucticus uropygialis meridensis* Riley, of Venezuela; in the extent of yellow anteriorly on the bases of the feathers of the interscapulum nearer *meridensis* than to *Pheucticus uropygialis uropygialis* Scl., of Colombia; differing from both *meridensis* and true *uropygialis* in having large white terminal, or slightly subterminal, rounded spots on the upper tail-coverts instead of small white or yellowish transverse subterminal marks on these feathers; lower tail-coverts whiter; tibiae yellower.

Type.—No. 145,557, Am. Mus. Nat. Hist., [♂], San Miguel Bridge, Urubamba Cañon, 5000 ft., Peru; July 19, 1916; H. Watkins.

Specimens examined.—Pheucticus uropygialis terminalis. Peru: Type locality, 1 [♂]; Chauillay, Urubamba River, 3700 ft., 1 [♂].

Pheucticus uropygialis uropygialis. Ecuador: 1 ♂; Mocha, Chimborazo, 1 ♀. *Colombia:* Subia, 2 ♂; La Mar, 1 ♂; Palo Hueco, 1 ♂; Fomeque, 1 ♂; Chipaque, 2 ♂ (all near Bogotá and hence topotypical).

Pheucticus uropygialis meridensis. Venezuela: Near Merida, 5 ♂ (topotypical).

Remarks.—Pheucticus uropygialis does not appear to be represented in most Peruvian collections. Kalinowski secured a female near Cuzco, which von Berlepsch, in reporting on his collections (Ornis, 1906, p. 103), states he had not seen. Jelski took it near Huanta and it is contained in the Raimondi collection from Huancayo. It was probably on Raimondi's specimens that Taczanowski (Orn. Per., III, p. 2) based his description in which the words "sus-caudales noires terminées d'une grosse tache blanche" indicate that he evidently had the race here described in hand. This white spot on the longest tail-covert of the type is terminal and measures 8 mm. along the shaft of the feather. In a second male, which is in the molt, and in which this covert has not yet attained its full growth, it measures 12 mm. and is margined by a black border 3 mm. in width.

A female collected by Heller does not agree with the female of *aureiventris*, as stated by Taczanowski, but differs from it in having the throat

and breast streaked with black, the upper parts pronouncedly blacker and the rump yellow, in strong contrast to the back. This female closely resembles one of true *uropygialis* from Ecuador, but has the white terminal markings of both wing-coverts and upper tail-coverts larger.

Catamenia analoides griseiventris, new subspecies.

Subspecific characters.—Male similar to male of *Catamenia analoides analoides* (Lafr.), of the Peruvian coast region, but abdominal region grayer, less white, the under parts therefore nearly uniform in color; second to sixth primaries (from without) with less white on their outer webs at the base; lower tail-coverts averaging paler and usually without the buffy tips which are always present in true *analoides*.

Type.—No. 129,178, Am. Mus. Nat. Hist., ♂ ad., Cuzco, Peru, November 16, 1914; H. Watkins.

Specimens examined.—Catamenia analoides griseiventris. Peru: Type locality, 1 ♂, 1 ♀; Pisac (near Cuzco), 4 ♂, 2 ♀; Chospyoc, 10,000 ft., 1 ♂; Huaracondo Cañon, 10,000 ft., 2 ♂, 1 ♀; Torontoy, 8000 ft., 1 ♂. *Ecuador:* Valle de Cumbaza, Chimborazo, 3 ♂.

Catamenia analoides analoides. Peru: Lima, 2 ♂, 1 ♀; Vitarte (near Lima), 9 ♂, 5 ♀; Huacho (north of Lima), 1 ♂, 2 ♀; Huaral (north of Lima), 5 ♂, 1 ♀; Sayun, 1 ♂.

Remarks.—Our excellent series of this species shows that most of the differences between specimens from the coast and those from the tableland of Peru, to which Taczanowski (Orn. Per., III, p. 21) long ago called attention, are diagnostic. The fact that specimens from the tableland of Ecuador agree with those from southern Peru, indicates that the race here described occupies the puna or paramo in both Ecuador and Peru, while true *analoides* is doubtless confined to the coastal region.

It is interesting to observe that *griseiventris*, in its gray abdomen and decreased amount of white at the base of the primaries, makes no approach toward the Bolivian *analis*, which indeed more closely resembles the Lima race than it does the one geographically nearest to it.

The Colombian form, *C. a. schistaceifrons*, is also more like the one occupying the Peruvian coast than the race which inhabits the intervening mountains.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

NOTES ON SPHENOPHORUS (COLEOPTERA).

BY F. H. CHITTENDEN.

During studies of the genus *Sphenophorus* certain forms previously undescribed have come to notice. These with some nomenclatorial changes, are treated briefly in the following notes.

Sphenophorus costicollis, new species.

Form similar to *robustus*, distinctly more slender, a little more depressed. Ground color dull red with clay-colored natural coating covering dorsal surface except thoracic vittae, shining red on exposed portions of sides, abdominal surface and sides of legs.

Rostrum five-sixths as long as thorax, subequal in distal four-fifths, last fifth slightly dilated with sides parallel as seen from side, posterior face not produced. Thoracic vittae strongly elevated, narrow, polished; median widest at middle, tapering and terminating at about the distance of one-tenth to base of thorax; lateral vittae of similar width with branch faintly indicated, basal half of nearly uniform width.

Elytra completely covered with gray coating without callosities; third interval wide, distinctly elevated; fifth narrower, less convex but wider than fourth or sixth, lower surface including legs and other characters about as in *robustus*.

Length 13 mm.; width 5.5 mm.

Described from a single female from New Orleans, La., collected April 26, 1918, by Mr. Thos. H. Jones.

Type No. 22,775, U. S. National Museum.

A well-marked species not likely to be mistaken for any described form.

Var. **callosipennis, new variety.**

Smaller than type of *costicollis*, ground color black or piceous, tending to dark red on exposed portion of sides of abdomen and of legs; coating either slightly reddish or yellowish. Median vitta a little longer. Third elytral interval polished black in basal half; a distinct sub-basal and sub-apical callosity.

Length 11 mm.; width 4 mm.

Dudley, Mo., March 29, 1919, collected by Mr. A. F. Satterthwait under drift. One female and two males.

Type No. 22,776, U. S. National Museum.

In the males the branch of the lateral vitta extends in a thin line nearly to the base of the thorax. The characters separating this form from *costicollis* do not seem of sufficient importance to indicate specific rank, but it may be considered a geographical race.

Sphenophorus glyceriae, new name.

Sphenophorus recticulaticollis Chttn. (nec Boheman), Proc. Ent. Soc. Wash., Vol. VI, p. 163, 1904.

Since Mr. G. C. Champion (Biologia Centrali-Americana, Coleoptera, Vol. IV, Part 7, 1910, pp. 160, 161), has stated definitely that he has seen the type of Boheman's *reticulaticollis* and that it is not the species described by the writer under that name, it becomes necessary to rename it, and the above is suggested.

This species has been observed by Mr. A. F. Satterthwait ovipositing on *Glyceria septentrionalis* at Woodrow, Mo., May 23, 1919.

Sphenophorus missouriensis, new variety.

Form similar to *pontederiae,* much smaller, depressed, color dull reddish, natural coating thin, pruinose. Rostrum rather long, somewhat strongly and uniformly arcuate, moderately compressed, finely carinate at middle, scarcely produced at apex. Thorax subquadrate, subapical fossa shallow, lateral vittae and punctation about as in *glyceriae,* in which it also agrees closely in most other characters.

Length 6.5 mm.; width 2.2 mm.

Two males collected with *S. glyceriae* on *Glyceria septentrionalis,* Woodrow, Mo., May 23, 1919 (A. F. Satterthwait).

Type No. 22,777, U. S. National Museum.

This variant differs so markedly in its more slender form, different shaped rostrum, apparently longer legs and in lacking the natural coating as to merit a varietal name.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

RECOLLECTIONS OF THE EARLY DAYS OF THE BIOLOGICAL SOCIETY.[1]

BY L. O. HOWARD.

In 1880 the workers of forty years before seemed to us almost prehistoric. I wonder if the workers of 1880 seem equally almost prehistoric to the young men of to-day. If reverence for elders has not entirely gone from the modern world (I know it has very largely) I can imagine that you look upon the founders of the Biological Society of Washington with at least a touch of that mental attribute which we used to call reverence or think of them perhaps as rather interesting old fossils. But as I look back the men who founded this society were very much like the men who compose it to-day. Even the first president, Dr. Theodore Gill, who was looked upon then as a man of extremely mature years, and who possessed a knowledge that only comes with long years, was in reality only 42 years old; and most of the others were in their twenties and thirties.

In 1880 the great concentration of scientific men in Washington was just beginning, and the great specialization was already making its appearance. Boston was still the scientific center of the United States, and I believe that not even the far-sighted Baird could have foreseen what we have all seen of the development of science under the governmental institutions in this city. The Philosophical Society had reached its destined repletion and was beginning to crack. The Biological Society was one of the very first of its children to leave the parental nest.

Already the young men who founded the new society have grown old and died, and I believe there are only two of them who are still active members of the Society in Washington—E. A. Schwarz and myself—curiously enough, both entomologists.

[1] Published by authority of the council, under a special fund.

I have elsewhere spoken of the coordination between the study of entomology and longevity, and this is perhaps another instance.

Speaking of entomology, the first meeting of this society was held in the house of an entomologist, the late Doctor Riley, but the first paper read before the society was by an icthyologist, the late Dr. Tarleton H. Bean.

When the society was founded I was a youngster of twenty-two. I had been elected a member of the Philosophical Society, but the secretary had forgotten to notify me of my election. I was an assistant to Prof. J. H. Comstock, at that time entomologist of the Department of Agriculture with a force consisting of Theodore Pergande, of a superannuated negro messenger with a taste for alcoholic preservatives, and myself. One day Dr. G. Brown Goode, young, filled with energy, and of charming presence and manner, called at our office and invited Professor Comstock and me to join in the movement to found the new society. Thus I became one of the original members.

In those days scientific men not only quarrelled (which, of course, they don't do any longer) but they absorbed the work of their assistants in the most extraordinary manner, some of them publicly defending this course and considering it entirely ethical. Looking over the proceedings of the society in the early years, we find no printed records of quarrels, but to men with good memories the titles and the brief printed statements recall many things which were never recorded in print and which it is lucky, probably, were never recorded in print. Thus, at the May 6, 1881, meeting Professor Comstock read a paper on scale insects. The record shows that on May 20th Doctor Riley discussed this paper and was replied to by Comstock. Just what they said has been lost. *Requiescat in pace!*

I attended very few of the early meetings. My evenings were otherwise spent—not so profitably perhaps, but more pleasantly to one in his early twenties. Undoubtedly I would have been a better and broader biologist if I had religiously attended all of the meetings, but I would not have had half as much fun, and probably I gained something elsewhere which has been of equal use to me in after life. This is heretical, but susceptible of argument.

In 1884 Doctor Riley (or rather one of his assistants—Web-

ster) made an important discovery, which included not only proof of a phytophagic habit on the part of an Hymenopterous parasite but established an alternation of generations with the species. Riley read a paper on the subject before the Biological Society, and I attended at his special request. The paper was couched in technical terms; its significance was not in the least understood by the audience, and I made my first speech before the society, under the head of discussion, by attempting to put into simple words of one syllable adapted to the limited understanding of botanists and ornithologists and mammalogists and paleontologists the fundamental biological importance of what Riley, in compliment to the wise physiognomies of his audience, had couched in polysyllabic terms of classical etymology.

The next time I was on my feet before the society, March 19, 1887, I read a paper of my own about a little aquatic insect of the genus Hydropsyche which makes webs under the water in Rock Creek and catches in these webs the larvae of Simulium, the adults of which are called buffalo gnats, or black flies, as well as other insects. That meeting had a greater interest than this personal one to me, since Alfred Russel Wallace was present and discussed this particular paper, expressing his astonishment that there existed forms which spun silk under water. Wallace was in Washington several weeks at that time, and attended more than one meeting of the society. His interests were very broad. He discussed from his wealth of experience, all aspects of biology. Unfortunately, he went into other things as well. He had already become a spiritualist, and his credulity regarding the acts of the most transparent charlatans almost destroyed the scientific idol which I had in a way worshiped since I first read "The Malay Archipelago."

This talk is not historical; it is simply gossipy and reminiscential, and it will necessarily be brief.

I wonder if some of those meetings would have seemed as extraordinary to you as they seemed to us. The story has often been told of how the society spent one whole meeting in discussing the position of the tail of the extinct Steller's sea cow, and then followed it two weeks later with another evening on the same topic, and then two weeks later with a third, the last of these three meetings continuing the discussion by special vote until half past ten! There you see were six and a half mortal

hours given up to a most intense discussion by Elliott, True, Coues and Gill on a point which seems not to have the slightest practical value to the world and which was finally settled in three minutes by Doctor Dall when, at the meeting of April 19, 1890 (years later), he exhibited a map drawn by a member of the Behring Expedition on the margin of which was a sketch from nature showing the tail in the position in which it was said to be by some one or more of the disputants, I don't know which.

There is another subject that came up for discussion several times in the early years of the society, and that is as to whether the turkey buzzard finds its food by sight or by an extraordinary sense of smell. The first time, I think, that this subject was brought up was in the discussion of a paper entitled "Notes Relative to the Sense of Smell in the Turkey Buzzard," read by Mr. C. L. Hopkins at the meeting of December 17, 1887. As I recollect, Mr. Hopkins was decidedly of the opinion that buzzards find their food by means of some extraordinary sense of smell; but there was a long and rather heated discussion, with the preponderance with Mr. Hopkins. Either he or one of the other speakers, I remember, told the story of some carrion completely hidden from view by a shed or something of the sort which attracted buzzards from great distances. But after many remarks, the following story was told of observations made by the late Dr. Otto Lugger. It seems that at a point on the beach of the lower Potomac, or it may have been Chesapeake Bay, there was a bluff a bit from the beach, and a fence running along the bluff. The farmers had the custom of collecting the useless fish, alewives and others, stranded on the beach or discarded from seines, carrying them up the bluff and putting them in a trench behind the fence, covering them with a sprinkling of earth, and eventually using them to fertilize their fields. Now, according to Lugger, buzzards would alight on the fence, always facing the beach, and would stand there for hours watching the shore for food. In the meantime the stench from the decaying fish ten feet behind them was overpowering; yet they sat there in their ignorance waiting for food on the beach totally unconscious of the hundreds of pounds of deliciously decaying food immediately behind them. After this story was told the argument stoppped; not another word was said, and the society ad-

journed. Did it settle the question? Or was the whole story an invention of the humorously minded Lugger?

At the meeting of April 30, 1887, the late Dr. J. H. Kidder exhibited some specimens, among them a round ball the size of one's fist and which was evidently composed of vegetable fibers and fragments, and (I imagine maliciously) gave no information about it except that it had been found on a shelf in the National Museum. And then the members began to guess. The most extraordinary theories were put forth. Van Deman, I remember, even thought that it might be one of the balls of hair from the stomach of a horse. After all sorts of theories had been advanced, Doctor Kidder stated that it had been taken from the shallow waters near the shore of one of the alkaline lakes of the West and that it consisted of fragments of aquatic plants which had been partially eaten by the larvae of the Ephydrid flies which inhabit these lakes and that the balls had been formed by wave action. I never knew whether he was right or not.

At intervals almost periodic there has arisen a discussion as to whether the flying fish flies. It may be of interest to know that this question was first brought up at the meeting of May 14, 1887, and that hot discussion followed in which W. B. Barrows, Admiral (then Engineer) Baird, Lucas, Goode, Hallock, Dall and Riley took part. Of course every one knows now that flying fish *can't* fly, just as every one now knows that flying fish *do* fly, and that the difference between the "can't" and the "do" depends entirely upon the definition of the verb *to fly!*

The decade from 1880 to 1890 marks what will possibly be known to history as the Gilbert and Sullivan era. Gilbertian expressions were quoted everywhere, and the charming jingle which began "The flowers that bloom in the spring tra la la have nothing to do with the case" may have suggested to that profound sociologist and eminent paleo-botanist, Lester F. Ward, the title of a paper which he read February 8, 1890, "The Flowers that Bloom in the Winter." In spite of the Gilbertian insignificance of the flowers of spring, Professor Ward's comments on the flowers that bloomed in the extraordinary winter of 1890 will be found of especial interest this year if the Washington botanists took the trouble to list the plants that flowered during the still more remarkable winter of 1918–19; but, as the botan-

ists now have their own society and have little to do any more with the Biological Society, how are we others to know?

In the spring of 1893 (meeting of April 22) O. F. Cook, then recently back from Liberia, read a paper on the natural history of that interesting colony of expatriated Afro-Americans. In talking of the termites, he referred to the fact that the queen lays eggs at the rate of about eight hundred thousand or more a day. This happened to be, I think, the only meeting in the history of the society which was attended by the well-known chemist, Dr. H. W. Wiley. Whether he was drowsy and lost track of the subject, and simply caught the word eggs and the number, or whether he intended to be humorous as usual, he nudged me and said in a whisper, "By George, what a fortune, with eggs at twenty-five cents a dozen!" I tell this story not only because it happened, but to remind you that there was once a time when hens' eggs only cost twenty-five cents a dozen.

Before this there was an interesting situation at the meeting of February 7, 1891, when Henry Fairfield Osborn came over from New York and gave a talk on cretaceous mammals. He was showing how a fossil jaw-bone on which Prof. O. C. Marsh had founded a new family, and a part of a skull on which the same authority had founded another family, and some back teeth on which he had founded a genus or some other division, and some front teeth on which he had founded another genus or some other division, all belonged, not to the same skull, but to the same species. I was much embarrassed in the course of this interesting exposition when the door of the assembly room opened and Professor Marsh walked in. I did not know that he was in Washington. As a matter of fact, my embarrassment was not shared by Osborn, who I think rather welcomed a discussion of his paper. But before he finished the door opened again and Professor Marsh went out. Was he angry? I don't know.

Not long ago, at one of our meetings, when General Wilcox presented to the society, for Colonel Roosevelt, a copy of one of the latter's books I told briefly the story of the only appearance before the society of the only naturalist President of the United States. It is worth repeating and perhaps may be made a matter of permanent record. When the program committee of the society was arranging the papers for the meeting of May 8, 1897,

Mr. Roosevelt, then Assistant Secretary of the Navy, had recently published a letter in *Science* criticising C. Hart Merriam's classification of the big game animals of America, not necessarily from the standpoint of the systematic zoologist, but from the viewpoint of a hunter, claiming that Merriam went into too many refined details, and that many of the points known to old trappers and hunters should be taken into consideration in basing a classification. Having this letter in mind, Merriam told the program committee that he would give a talk on big game animals at the May 9th meeting if Mr. Roosevelt could be induced to be present and to discuss the paper. So it was arranged. I was president of the Biological Society at that time, and after the meeting (in the old hall of the Cosmos Club) was opened Mr. Roosevelt and Mr. W. Hallett Phillips came in at the back end of the hall—rather conspicuous because they were the only persons in the room in evening dress—and listened with intentness to Merriam's talk, in which, of course, he riddled Roosevelt's argument in *Science*. It was a long and very interesting address. At its conclusion I invited Mr. Roosevelt, although he was not a member of the society, to take part in the discussion, whereupon he and Phillips came to the front, Phillips sitting in a front seat, and Roosevelt began to talk. He made a very forceful argument from his viewpoint and from that obviously of other hunters, and rather staggered some of the really scientific men in the audience by the cogency of his reasoning. He talked at length, as was customary with him, and the hour of adjournment (10 o'clock) came before he had finished, but by unanimous vote he was allowed to proceed until he was satisfied. He sat down after having made a distinct impression on his scientific and rather critical audience. Merriam asked for five minutes in which to reply, in the course of which he completely demolished the Rooseveltian argument, and there was nothing more to be said. It was a memorable meeting, and no one who was there will ever forget it. Most of us saw Roosevelt for the first time then, and were greatly impressed by him. Among the taxonomists present there were, of course, lumpers as well as splitters, and the lumpers got some satisfaction from the future President's arguments.

It is only rarely that I tell a story in which one of the characters is anonymous, but the circumstances connected with this

one are such that I fear I must not mention the name of a very well known speaker who was invited to address the society during the early nineties, but whose remarks were disappointing in that he started off with a profound introduction and then proceeded to elaborate his thesis in a manner which was characteristic of the man and which by no means upheld his well-founded scientific reputation. The meeting adjourned, and as I passed out of the room, Dr. Theobald Smith, touching shoulders with me, said, "Did that talk remind you of one of the Chinese puzzle boxes?" "No, why?" I said. "Why you must know those trick boxes where you work for a while and finally open it, and then find another box inside, and you work for a while and open that and find another, and you keep on opening boxes until down in the middle there is a very small insignificant box." Of course I was delighted with this, and going into the adjoining room in the Cosmos Club found Dr. G. Brown Goode sitting there sipping from a tall glass. I told him this incident with great joy, and had no sooner completed it than I was horrified because it suddenly occurred to me that the speaker of the evening was a former teacher of Goode. However, I need not have worried, because he smiled his genial smile and said, "I peeked into the room and saw that Blank was getting confidential with his audience, and so came in here and ordered a bottle of beer."

All of these incidents occurred at least nearly 30 years ago. Many strange things, however, have come up in our meetings in more recent times, as for example:

> Extract from Proceedings of The Biological Society of Washington January 20, 1906:
>
> Dr. Albert Mann related a case of the capture and raising from the floor of a snake by a spider in Pennington (N. J.) Seminary.

Dr. Mann apparently did not explain what the snake was doing in the seminary! Dr. Mann is always entertaining and scientifically veracious when he talks of Diatoms, and in this story he was surely entertaining.

But enough of these stories. Since those very early days the Biological Society has swollen and cracked and given out satillites, just as did the old Philosophical Society. The entomologists broke away first, then the botanists, and now the Aquarium Society has been founded, and the Naturalists Field Club has

been in existence for a long period, and I can see that the mammalogists, the ornithologists and the herpetologists and the malacologists will, before many years, be founding their own local organizations (the helminthologists already have one). But if they remain satellites and circle around the old parent body we shall not complain. Most of the special workers, however, fail to see the advantage of the broadening out which the meetings of the Biological Society can give them. For myself, I am an entomologist all day long and every day in the week—I am living with entomology. But I am not a biologist unless I not only read along other lines but unless I go to the meetings of this society; and I enjoy it honestly, more than any other society. I like to hear Hay, Jr., talk about his turtles; I enjoy Hitchcock when he lectures on grasses; when Lyon talks bacteria my mind is open; when the elder Hay comes in with a monstrous fossil I listen with the same pleasure as when Palmer exhibits one of his perennial finds along the shores of Chesapeake Bay even if I am somewhat saddened by his pained expression of countenance whenever he speaks in public; and the other Palmer in his new side line of the history of science is intensely interesting, and I leave every meeting feeling perfectly convinced that if I were taken away from Washington one of the things which I should most mourn would be my inability to attend every one of these meetings. I fail entirely to understand why others of the older members of the society have not this same feeling.

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